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Editor - Captain H. GARBETT, R.N. (Retired).

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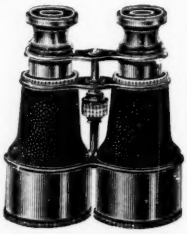

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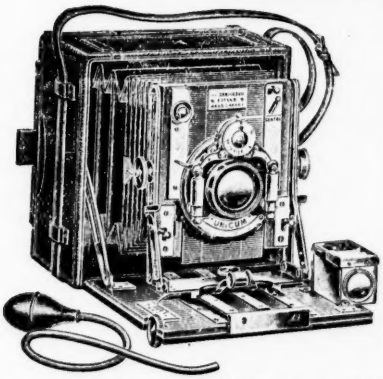

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27th—P. U. Johnson 9,518		53rd—G. J. P. St. Clair 9,023	
28th—E. Cummings 9,500		70th—C. H. Ommanney 8,740	

July, 1901.

20th—G. H. Donnelly 9,699		64th—R. F. Cottrell 8,275	

SANDHURST, December, 1901.

CAVALRY.

10th—F. B. Hurndall 5,781		16th—L. C. B. Merriman... 5,133	

INFANTRY.

93rd—G. R. H. B. Maitland-Addison... 6,491		— C. A. Tennyson* 5,596	
— —J. Stirling* 5,893		— H. A. Ibbotson 5,573	

July, 1901.

3rd Cavalry—V. C. P. Hodgson ... 7,539		104th Infantry—H. Hart... 5,807	
45th Infantry—H. G. Bignell 6,723		120th ,, H. T. C. Jones-Vaughan 5,590	
96th ,, M. J. Raikes 5,911		4th King's India Cadet J. S. Oldham ... 5,521	
97th ,, J. G. P. Romanes ... 5,886			

INDIA FORESTS, July, 1901.

5th—Pelham Stewart Corbould 6,550

COOPER'S HILL, July, 1901.

— F. W. Abbatt... ... ... —

MILITIA MILITARY COMPETITIVE.

Special arrangements have been made to meet the requirements of Militia Officers preparing for the Competitive Examinations to be held under the new regulations, and the important subjects of MATHEMATICS and MILITARY HISTORY are under the personal supervision of MR. CARLISLE and CAPTAIN JAMES respectively.

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Under the New Regulations.

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10th—C. W. Watson 16,949		— *M. L. Slaughter 9,720	
13th—H. C. Stephen 14,830		— *W. C. Hutcheson... 9,663	
— *H. A. Hildebrand 9,750		— *G. H. M. Marsh 9,661	

UNIVERSITY.

13th—A. E. Burnett 5,035		14th—R. C. G. Pollock 4,970	

CAVALRY.

— E. R. Holloway 10,162

March, 1901.

Under the New Regulations.

CAVALRY.

1st—C. E. Pym 18,159		2nd—H. H. Webber 14,160	

ROYAL ARTILLERY.

4th—K. E. Milford 17,357		6th—J. W. Povah 16,898	

FOOT GUARDS.

4th—E. S. Ward 8,281

INFANTRY.

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8th—T. E. Bennett... 18,103		22nd—L. A. Jones 16,733	
9th—H. J. U. Wilkins 17,981		— *V. F. Jackson 15,401	

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3th—A. F. Attwood 5,415		33rd—G. M. Jennings 4,030	

Under the Old Regulations.

INFANTRY.

3rd—H. L. Ainsworth 20,255

STAFF COLLEGE.

August, 1901.

The following Officers, who read exclusively with us, passed on the Competitive List:—

Capt. J. W. E. DONALDSON, Royal Field Artillery.
Capt. G. McK. FRANKS, Royal Garrison Artillery.
Capt. G. A. F. SANDERS, Royal Engineers.
Capt. A. GRANT-DUFF, 1st Bn. Royal Highlanders.
Capt. A. H. H. WILSON, 2nd Bn. Wiltshire Regt.
Capt. N. MALCOLM, D.S.O., 2nd Bn. Argyll and Sutherland Highlanders.
Capt. S. W. KING, Indian Staff Corps.
Capt. H. D. FARQUHARSON, Royal Marine Light Infantry.

And in addition, the following Officers received Nominations:—

Brevet Colonel A. W. MONEY, Royal Artillery.
Capt. A. R. FINLAY, 2nd Bn. Bedfordshire Regt.

* Subsequently admitted.

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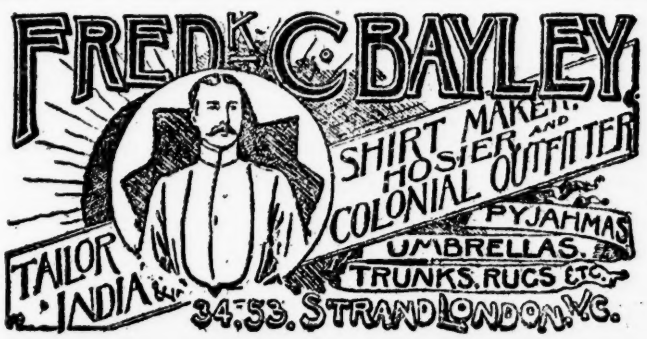

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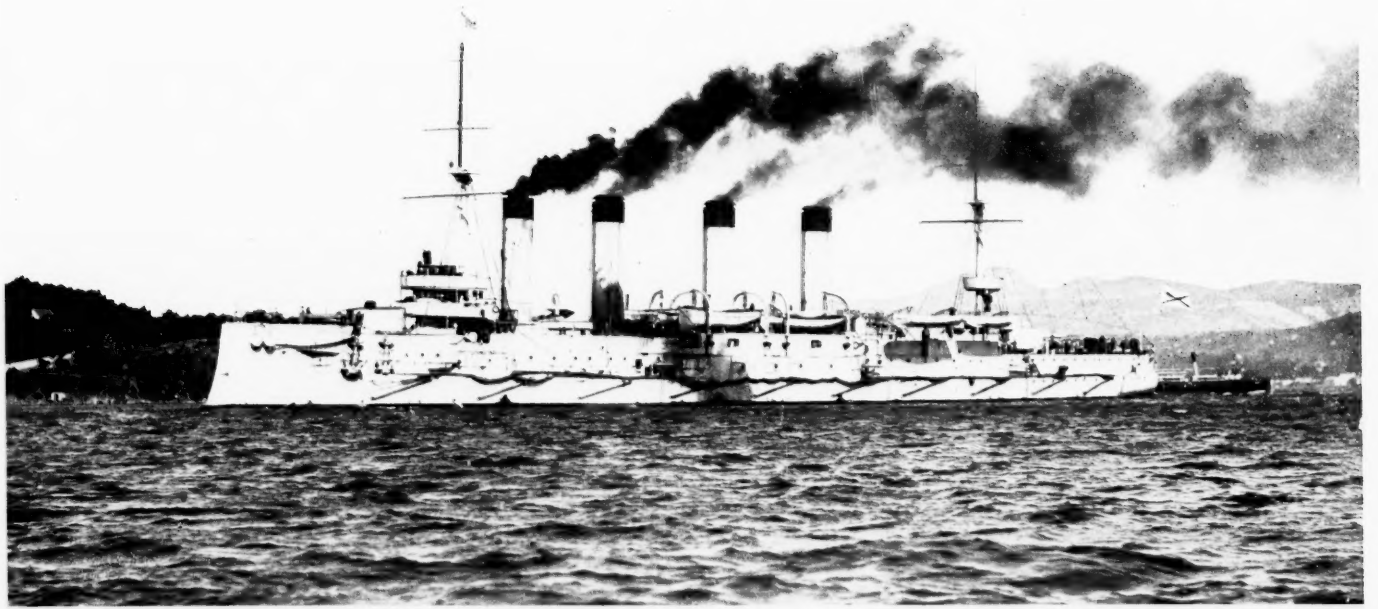

THE NEW RUSSIAN FIRST-CLASS ARMOURED CRUISER "BAYAN." 7,800 Tons; 16,500-I.H.P.; Speed, 21 Knots.

For further particulars, see Naval Notes.

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On the occasion of a recent visit of the Prince of Wales to the Museum of the Royal United Service Institution, His Royal Highness evinced particular interest in the silver Statuette of Lord Nelson which the Council made an unsuccessful effort to acquire for the Institution by subscription last year.

The Statuette is of standard silver, weighs 893 ounces, and stands 2 feet 9 inches in height. The workmanship has been pronounced by experts to be early nineteenth century, and the modelling to be exceptionally fine. The Statuette was presented by His Majesty King George III. to the great Admiral on the anniversary of his victory of the Nile, and is, therefore, of historic national interest, as well as an object of artistic merit and intrinsic value.

His Royal Highness the Prince of Wales has expressed the hope that the Statuette may yet be acquired by the members of the Institution, and has given practical expression to this wish by graciously accompanying it with a donation of £10 to the fund if it should be re-opened. In these circumstances the Council feel that it would be the wish of the members if another effort were made to obtain the funds to purchase the Statuette. And it has occurred to them that, after the interest which His Majesty the King has always shown in the Museum of the Institution, and in view of his having lately deposited in the Museum the relics of H.M.S. "Victory" from Windsor Castle, the present would be a fitting opportunity for another appeal to the members to contribute the £500 required to purchase the Statuette, and place it in the Museum in commemoration of His Majesty's Coronation and happy restoration to health.

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R.-Adm. H.R.H. The Prince of Wales	10	0	0
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R.-Adm. W. B. Bridges	20	0	0
Anonymous	20	0	0
J. A. Mullens, Esq.	10	10	0
Lt.-Col. R. W. Inglis	10	10	0
Adm. Sir E. G. Fanshawe	10	0	0
Messrs. Drummond	5	5	0
Adm. Sir N. Bowden-Smith	5	0	0
The Duke of Hamilton, R.N.	5	0	0
Major R. H. Jary	5	0	0
Commander E. P. E. Jervoise, R.N.	5	0	0
Capt. W. A. Tollemache	3	3	0
The Rt. Hon. Lord Kelvin	3	3	0
Adm. Sir Erasmus Ommanney	3	3	0
2nd Lieut. C. L. Patton-Bethune	3	3	0
Lt.-Col. H. L. Florence	3	3	0
Adm. Rt. Hon. Sir J. C. Dalrymple-Hay	2	2	0
Adm. Hon. Sir E. R. Fremantle	2	2	0
Lt.-Col. R. M. Holden	2	2	0
Lt.-Col. A. Longley	2	2	0
Major C. H. Wylly	2	2	0
Lieut. C. P. Wilson	2	2	0
Col. C. F. Bell	2	2	0
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Col. Lord Raglan	2	2	0
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Lieut. B. E. Sargeaunt	1	1	0
Major C. J. Davenport	1	1	0
Capt. C. E. H. Laughlin	1	1	0
Major J. F. A. McNair	1	1	0
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Col. F. W. Lambton	1	1	0
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Col. C. E. Bates	1	1	0
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Capt. A. C. Clarke, R.N.	1	0	0
Capt. F. G. Stopford, R.N.	1	0	0
Capt. S. A. Johnson, R.N.	1	0	0
R.-Adm. W. H. Henderson	1	0	0
Lt.-Col. A. G. Holland	1	0	0
Capt. P. H. Wright, R.N.	1	0	0
Capt. A. M. Drummond	1	0	0
Major S. M. Milne	1	0	0
V.-Adm. H. J. Carr	1	0	0
Major P. T. Clark	0	10	6
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January 7th (Wednesday). "The Siege of Delhi, in 1857." Illustrated by Lantern Slides. By Lieut. Henry Chamberlain, R.N. (retired).

January 9th (Friday). "The Recent Campaigns in Tirah, Burmah, and China. Illustrated by Lantern Slides. By T. Miller Maguire, Esq., LL.D., Barrister-at-Law.

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By Order,

R. M. HOLDEN, Lieut.-Colonel,
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ERRATUM.

November Journal, page 1458, line 33, for "coske," read "corke."

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[*Authors alone are responsible for the contents of their respective Papers.*]

AMALGAMATION OF BEARER COMPANY AND FIELD HOSPITAL AS A MILITARY UNIT.

By Staff-Sergeant H. STAPLETON, R.A.M.C. (Vols.)

Friday, 28th February, 1902.

Colonel W. L. GUBBINS, R.A.M.C., in the Chair.

THE subject dealt with in this paper is a proposal to amalgamate a Bearer Company and a Field Hospital into one medical unit. At present it is two distinct units. Such amalgamated company I will call provisionally a First Field Hospital. The letters F.F.H. are distinctive enough for my purpose to-day.

Those who know something of these two units will understand the purpose of this paper to be that of adding to the *mobile* bearer company such hospital establishment as will enable it to give shelter to the wounded in addition to its present work of first-aid and immediate surgical treatment on the field. Only such work as a non-medical man could deal with is considered—the business arrangements that is. In order to keep the main purpose clear, Service methods and Service stores alone are referred to; not but what there may be better schemes of training and better kinds of equipment, but any such improvement can be more profitably considered later, when, or if, the amalgamation is decided on.

Although consideration is given mainly to R.A.M.C. work during and immediately after a big fight, it will be found that the special training will not interfere with the employment of the *personnel* in quieter times, on service, or during peace.

In those few hours at the close of a general action the medical service at the front will be fully employed—every part of it; and the

alleviation of suffering will be many times greater if methods can be practised in peace which will tend to systematise themselves whatever the conditions are on the battle-field.

Scope of Duties.

The "Manual R.A.M.C., 1899," defines the work of the Medical Service of the Army. It can be put shortly but fairly as "tending the sick," and "in the field," "that of speedily collecting and succouring the wounded during and after an engagement, and removing them from the battle-field to the field hospital."

This paper deals with the wounded only on a battle-field; the sick will be in hospitals further to the rear.

From what point are we to set out? We cannot be far wrong if the F.F.H. is prepared for the extremest pressure of work, and that is surely most likely to be after a big fight, such as a Gravelotte or a Waterloo. At such a time assistance of every degree will be greatly needed, and, if it is possible to cope with the work at all, it will only be by previous training in carefully thought-out schemes which have accustomed men to certain methods of working, to the use of suitable equipment, and to turn their hands readily to all or any of the numerous duties that may fall to an ambulance soldier. If this training for probable duties on a battle-field were a race, then the competitor that is "fit" could stay the whole course at full speed, and give a good account of himself even if he did not overcome everything; and if he is not called on to exert himself to the utmost, he is none the worse for having a reserve in hand—none the worse for being trained to do more than he is asked to do at one particular time.

The theory underlying medical army work is that the soldier, when wounded in action, shall receive immediate attention from men trained in first-aid, then that he shall be removed to skilled surgical aid at the dressing station, and after that conveyed to a hospital. The same purpose, viz., that of early and continuous care and attention underlies this paper, but at present the bearer company that brings in the wounded soldier has no means of giving him shelter; for the F.H. is under another command, and may or may not arrive in time to receive the wounded man as soon as he is ready to go in.

It is assumed that the bearer company, with its ten ambulance wagons, is able to get on to the field, for every succeeding manual has kept that detail intact, and since the ambulance wagons are empty when a battle is likely to take place, it is proposed to load four or five of them with some of the field hospital stores, which stores will be taken out when the spot selected for F.F.H. camp is chosen.

In this way no increase of transport is required, and if a F.F.H. does arrive, it will be there quite prepared of itself to render, not only first aid and first treatment, but immediately to supplement that by a fair amount of hospital treatment. There can be no question of the immense benefit it will be to a wounded man if he can be got under some sort of cover, and be given even one blanket and one waterproof sheet. At present the chances are that he will be either jolted over rough roads to a field hospital or left exposed to the cold night air and the rain that so often falls where much firing has gone on during the day.

Conditions under which the Work has to be Performed.

The great improvements in fire-arms tend towards making the rendering of immediate aid in exposed places almost an impossibility; and yet to leave wounded men under fire, without some attempt at relieving their pain, may be policy, but it is most repugnant to men who take a pride in the work of tending wounded, for it looks like failure or neglect.

What can be done under fire, if anything can be done at all, men can do *singly*. One ambulance soldier can get forward with no more risk than a fighting soldier, and this bearer can by himself most likely perform three-fourths of the entire duty he has to do on the field. He can administer water and stimulant, he can arrest bleeding, and he can apply dressings and splints and possibly move a man a yard or two to some sheltered hollow. The fourth part of his duty, as per manual, is the removal of the patient; it will be no great disadvantage if that is done a little later, under less trying conditions.

The removal of a wounded man requires, according to the manual, a squad of four men. This squad exposes a surface of about 6 feet by 6 feet if advancing or retiring, and 6 feet by 8 feet if moving to a flank: thus they offer an immense target, and a slowly-moving target too, for bearers must move slowly if they are to carry a patient carefully. It was impossible for bearers to collect wounded in 1870-71 under severe fire, and rifles and guns work still more rapidly and at much longer ranges now than they did 30 years ago.

Since parties of men are necessary to remove wounded, and stretcher-parties cannot work where severe firing is going on, it follows that *when* they are able to start, then the most rapid collection will be well worth organising for, and particularly so if close at hand on the battle-field a F.F.H. has arrived which can provide skilled surgical aid at once to those that need it, and shelter and nursing to those whose first dressing is sufficient for the time.

The suffering caused by exposure and a further journey to a field hospital may completely neutralise the surgical work that has been

promptly and efficiently performed; this extra suffering is chiefly caused by the absence of shelter, and therefore should be preventable. For surely it will be possible to get hospital equipment so light that it will not hamper the extreme mobility that a bearer company now has, and which a F.F.H. must have in at least equal degree.

Special Requirements.

Details of the working of the F.F.H. on the battle-field we will leave for a minute, and just touch on points that concern the *personnel* and the equipment. In the former department the present training will suffice, except that there is a distinct call for some men, who shall be trained to go forward, individually, up to the firing line. It has been the pride of officers to take these places of danger, but in a big fight the officer on the field (one officer per bearer company, and one bearer company per brigade) will not be able to cover any appreciable part of the ground that his brigade takes up, and even if he is able to pass from flank to flank, he is really too highly trained for the general work that is demanded there. The work he would do could be, for a large part, sufficiently well done by men that he has trained; and a dozen of these specially trained men could ordinarily cover the front a brigade would take up, fairly well.

First Class Bearers.

It is asking a good deal, and yet men would certainly qualify for such work, if it were recognised and encouraged. Is there any reason against grading such men as First Class Bearers? First, second, and third class orderlies are recognised for hospital work; is it not worth while encouraging men to get this other qualification too? Much is required of such a First Class Bearer—he has to go forward alone—possibly crawl forward—taking any advantage of cover, but getting forward somehow. He has to treat most serious cases, and the amount of good a man will be able to do depends on the training he has had in self-reliance and in resourcefulness, as well as in school and drill ground methods. Under this great excitement of working alone under fire nobody will do the utmost that is possible, unless there has been previous training in conditions as similar as it is possible to devise. If the training of such men is approved, it will be of course carried out in peace-time, and if it is to be done effectively, it must be by treating the business of training bearers without so much routine—as a sport, as well as a business, in fact. And by that I mean that opportunities shall be given at drill for men to practise all exercises in unexpected conditions, as soon as they have been firmly grounded in principles, not before.

Prizes are given, often not so much for intelligence as for automatic excellence.

When men—even private soldiers—have to act on their own judgment, as in a medical corps, the training should encourage some individuality in the way strict, well-defined principles are applied; for men's lives and men's limbs may depend on a bearer's appreciation of the essential requirements.

"Bearer" is the term used, but carriage of wounded is not the most important of his duties. Each bearer, no matter how little service he has, may have to supervise untrained men to convey wounded in times of great pressure. It rests, however, with the authorities to deal with such a method of training, for the men will be trained for whatever they are likely to be inspected for; and in an appendix are a few notes on adaptation of drill for this purpose.

Red Cross Signs.

To pass from that point to another: To indicate the whereabouts of medical help is a matter which deserves some consideration.

Everybody knows the Red Cross and its import. Of all military signs it is the one that should be clearly and unmistakably shown, under any and every condition of daylight or night, calm or storm; and yet the regulations say that at night two white lights placed side by side indicate a medical corps station. Even if such an arrangement of lights is known, there is nothing distinctive about it; the chance placing of two lights on the ground anywhere, or on a wagon or tents, would simulate the sign; or the true sign itself may easily be rendered inefficient by another light that aligned with it by chance. The presence of medical help without indication of its whereabouts is a power for good probably lost. False indications are worse still; and unknown signs are practically as bad as none at all.

What objection can there be to using the Red Cross for night as at day? It is not difficult to rig up five lanterns on a pole—as diagram No. 1—or on anything else that may suggest itself: on side of wagon or tent, or on trees; and then there can be no mistake. The regulations for encampment give various combination of lamps for indicating where certain departments are: where H.Q. are, and so on; and any odd arrangement will be justifiable for such purposes, as the enemy might like to know some of these things; but no tactical reasons need come in here with us. When medical help is wanted, at war-time or at home, it is wanted at once; and the custom is followed here in a *town* to mark the doctor's residence by a red lamp. Presumably it is considered necessary, since it is practically universal. If it is advisable or necessary here in England to have red lamps, where there are always people about, how much more will it be desired on a battle-field to know exactly where the doctors are!

It may not be possible to pitch the operating tent till evening, and in the meantime bearers will have gone forward to render first-aid. An absolutely distinctive sign is required to indicate the place they are to bring the wounded to. The slightly wounded themselves may creep along to it; and everything is simplified if the Red Cross can be seen —labour and suffering both minimised. Wounded stand little chance of being sent in a mistaken direction and their suffering prolonged; and the fatigue of carrying in the wounded will be reduced to the smallest amount. The bearers' work depends so much on the way it is performed, therefore men should not be tired out unnecessarily.

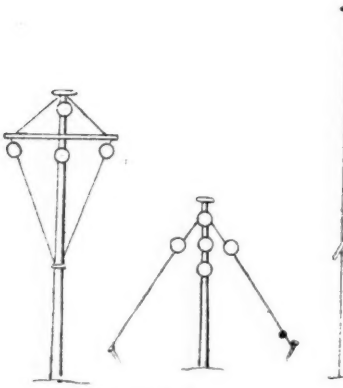

DIAGRAM 1.

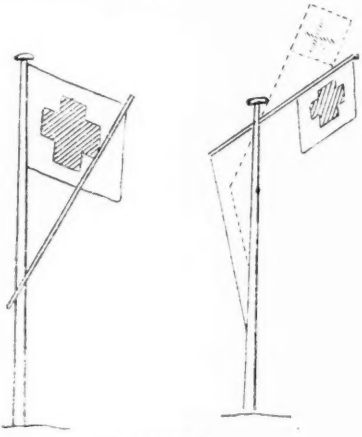

DIAGRAM 2.

One sees pictures of stationary hospitals at the Cape, with the flagstaff, and on it at night some kind of light is doubtless put up. Replies to questions on this point have been confusing, any kind of light was made to do, it appears—but since the position of the hospital was known, it did not matter much. It is quite otherwise with a hospital that marches straight on to a battle-field, ready to set to work immediately.

At such a time the importance of clearly indicating where surgical aid is is paramount. And I respectfully submit that no combination of lights will serve the purpose so well as five ordinary red lanterns—arranged as a cross—candle lanterns, if nothing better can be managed—but acetylene might be used very possibly. Perhaps one good light might even suffice if used to illuminate an extended flag or the cross on the side of a wagon.

One word more before I leave this matter of indicating the presence and exact position of a hospital. It is to do with day-time, now. If there is no wind blowing, the flag hangs close to the flagstaff, and consequently does not show—might as well not be run up, for all the

good it is. It is easy to extend the flag by a piece of stick, tied to the outer upper corner, and to the staff, as the sprit of a barge extends its sail; or in this other way (diagram No. 2). Or the flag might be tied between two wagons or trees. The means of exposing the flag would rarely be wanting, if orders were incorporated in the manual that it must be done effectively under all circumstances. As a matter of fact, the flag is missed out of the plan for a dressing station altogether in the present manual.

The next step to take now is to put forward the scheme of working a F.F.H. Company on the battle-field, and it will be understood that it is only possible to deal with the matter as a general principle.

The *personnel* of this proposed F.F.H. has 5 officers (4 surgeons, 1 quarter-master), 8 non-commissioned officers, and 60 rank and file—73 in all. An increase in number of a bearer company by 12; but less than a combined B.C. and F.H. by 27 of all ranks.

They will be detailed thus:—

——	Med. Off.	Qr.-Mr.	W. O.	Sgt.	Bugler	Cpl.	Pte.	Total.
2 stretcher sections for attending to and collecting wounded	1	—	—	2	—	—	32	35
For collecting station or director of wagons ...	—	—	—	1	—	—	—	1
Wagon orderlies, one to each wagon	—	—	—	—	—	4	6	10
F.F.H., including dressing station	3	1	1	4	1	2	15	27
								73

DETAILS OF DUTIES AT F.F.H.

2 Medical Officers for operating tent.

1 Medical Officer to inspect wounded on arrival and decide whether for hospital tents, or operating tent, and to generally supervise the arrangement of hospital.

1 Quarter-Master.

1 Warrant Officer—chief wardmaster.

1 Quarter-Master-Sergeant as steward.

1 Sergeant as compounder.

1 Sergeant as clerk.

1 Cook.

1 Bugler.

2 Corporals
12 Privates } general duty ward orderlies.

3 Cooks.

27

Working on the Battle-field.

The idea that governs the employment of this company will be best conveyed by describing their work as though they had just arrived while a fight was proceeding.

First of all, one medical officer would take his 2 sections of stretcher-bearers and 2 sergeants, and get as far forward as possible with them, attending to any they come across, but not at present transporting them, unless it has been found possible to choose a site for the F.F.H., or there are houses near.

When this party is approaching the zone of severe fire, they will, as a whole, take cover, and only some few selected individuals—say all the No. 4's, with their surgical haversacks and water-bottles, 8 in all, 1 from each stretcher-squad; these and 1 sergeant or the officer will get forward to the firing line somehow, and availing themselves of any suitable formation of the ground and of any kind of progression that may best serve the purpose. Their duty will be to get to the places were men are falling, and to do the best they can on the spot for the wounded, by themselves, or in conjunction with regimental aid, and with the idea that it will be an hour or two before it will be possible to commence removing any of them to a hospital. At the same time, local conditions vary so much that the first class bearer may be able to move a man a short distance to more perfect shelter, if circumstances are favourable. Besides doing good work on the spot, each of the eight first class bearers will be getting information as to where the most serious cases are, so that when the transporting agencies arrive—stretchers, or carts, or wagons—they can be set to work in some sort of method.

An officer, sergeant, or a first class bearer, working in this way, might signal back the probable numbers of cases in his neighbourhood; also any that may require special surgical attention, and possibly indicate the places on the field where the F.F.H. could pitch its tents. One great point is, that an attempt is being made to attend to the wounded at the earliest possible time, and arrange for the succeeding phases, too.

Practically nothing of this can be done when working in squads, nor in any way except by men working independently. Two men are crowd enough—a stretcher-squad is too great a target for working with under fire. When the firing has gone down in that particular district, then the stretchers and the three men with each can advance, and pick up the wounded. The No. 4—the fourth man that makes up the complete squad—is already there, and can lend a hand generally in loading the stretcher, according to Manual R.A.M.C., which directs that four men are to be practised in lifting one patient. It can be done, and will

have to be done with fewer bearers; but, at any rate, it is well to use four if they are to hand. In some injuries four bearers are necessary.

If it is possible to get ambulance carts or wagons on the field, the patients can be loaded into them at once; but it is not intended that a wounded man shall have to be carried any distance, but rather that the operating tent and hospital tents shall be brought right up to the spot where the greatest number of casualties are. At this point, we have means now on the field of transporting wounded that already have received first aid. The work can only proceed without hindrance if the place they are to be carried to is known.

There need be no hindrance on that score, for the O.C.F.F.H will have either chosen his place, or they must wait till he does and erects a flag, or distinctive lanterns. Flag or lanterns will be the point all are to make for, because in a very few minutes the operating tent will be pitched by seven men—the surgery and office, being bell tents, take very little time to put up; and the hospital tents can be pitched one at a time, as men are available, and as they are required to accommodate patients.

Reference is already made to the way work is allotted at this F.F.H.; and since surgical help and hospital tents are on the ground, under the same command as the bearers are, it follows that wounded may now receive, not only stimulants and treatment, but they will be given shelter under canvas, and such warmth as a waterproof sheet and blankets may provide.

The lightly constructed tents and the equipment it is possible to get on the field may be less than one would desire; but it will be a great advance on conditions which depend on the arrival of another unit before any shelter can be given at all, or a journey which can but cause more suffering. All the necessary equipment is being conveyed to the spot without any additional transport, for the P.M.O. would take good care to clear his front of sick before a big fight was likely to take place, and therefore the ambulance wagons, being empty, some can take hospital stores, until they are required for collecting wounded, and that will not be until the hospital is ready. If it should happen that the F.F.H. was made stationary for a few days, the transport could be used for any other hospital work; and this scheme is such that it will not be difficult to employ another F.F.H. when there is great pressure, and this other F.F.H. could be set free probably the same day or the next.

A word or two now on the arrangement of tents forming a hospital. Diagram No. 3 is a reproduction of the plan in the Manual R.A.M.C., for a field hospital of 100 patients. It is evidently intended to be of a stationary character, hence the need of so much space between the tents.

In such a hospital the serious cases will be well known, and may therefore have special orderlies detailed to attend to them: all will be better for being under continual observation as in a ward, but such care cannot be given when bell tents have to be used, arranged as diagram, for as soon as the orderly gets his head outside the canvas he cannot see the patients, nor would it be easy to call his attention if he is in another tent.

There is very great difficulty of supervision when patients are placed in a hospital of this kind, but the work will have become organised in a stationary hospital, after a day or two, and such a plan as this, and such tents as these can be made, sufficiently effective when there is no great pressure of cases.

But we are considering to-day entirely different conditions, and no previously made cut-and-dried plan can be devised to deal with circumstances which will only develop themselves just at the moment that we have to deal with them. As in one direction at least we shall be safe to form a plan, and that is to arrange or re-arrange our work so that everything shall tend to obtaining the most thorough attention to all patients for the first few hours or days, this F.F.H. has its most important work to do. Since the camp of a F.F.H. is not likely to remain in one place for many days (it is essentially an emergency camp formed to meet the first rush of wounded), it is justifiable to place the tents closer together when by so doing more thorough nursing is obtainable. A re-arrangement can take place later if advisable—there will be opportunities—removals there are sure to be.

In military matters one learns soon to do the best one can with whatever is issued, and although the bell tent is unsuitable, we may have to use it, and it is proposed to put the 25 tents into groups of five, as diagram No. 4. That arrangement will give an orderly a little better chance of looking after the wounded; but do what we will, they are not suited for the work.

Another tent issued to the medical service is the H.P. marquee. This is comfortable enough, for it is double-walled and double-roofed, but it is too heavy for carriage with these rapidly moving F.F.H.'s. What is wanted is something no heavier than the bell tents, and at least as roomy as the H.P. marquee.

The present pattern of operating tent would do very well; seven of these give practically the same cover as 25 bell tents, and the extra weight is not much. These seven operating tents will each take 14 men, and allow 3 feet by 7 feet of floor space per man, or 98 in the seven, and 20 can be got in with an allowance of 7 feet by 2 feet, or 140 in the seven tents. As to weight, the 25 bell tents are about 1,125 lbs., while the seven operating tents weigh 1,267 lbs. (each 181 lbs.), or an addition of 142 lbs. If six of these operating tents are considered sufficient, then the

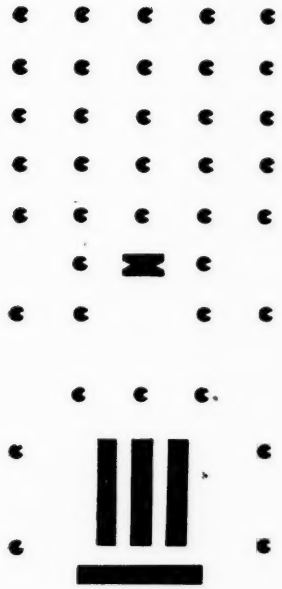

DIAGRAM 3.

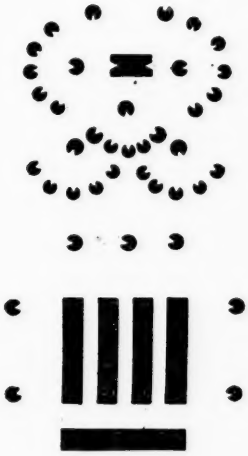

DIAGRAM 4.

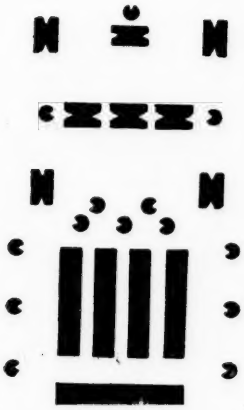

DIAGRAM 5.

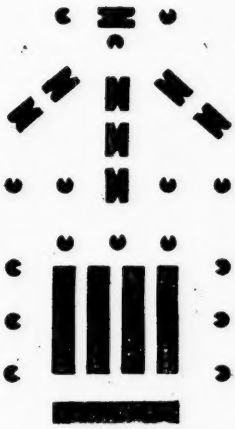

DIAGRAM 6.

weight will be about 40 lbs. less than the 25 bell tents, and if the space, 2 feet by 7 feet, is enough, then there will be shelter for 120 in the six tents; or at 2 feet 6 inches, 16 men per tent, or 96 in the six tents.

Air space will be less per man than the bell tent gives, but with two ventilators, one at each side, and two doors, one at each end, it is no worse than the bell tent. Diagrams 5 and 6 are drawn out to indicate arrangements of O.P. tents as wards. Something of this sort will make the work of supervision and watching the individual wounded soldier possible with the very few orderlies available at first.

The diagrams have been made symmetrical mainly because the influence of diagrams in Army books is too strong to be resisted, but such well and truly dressed lines are not wanted particularly. It will not matter at all if the ward tents are placed irregularly round about the operating tent, just as the formation of the ground may give facilities for obtaining fairly level surfaces to lay the patients on.

Having explained the general principles of work of a F.F.H. and the purpose it is primarily intended for, nothing remains but to draw a few conclusions.

First, it is quite possible with present *personnel* and material to make that change, for there is practically no further training required than is given now. The remarks on the qualification for a first class bearer are nothing more than what a variation in practice at drill will give. That is the chief departure in training, and that is a very slight one.

And as to numbers, a F.F.H. will work with 73 of all ranks, a bearer company has 61 at present and a field hospital (for 100 beds)—40. So the amalgamation will reduce the number of the two units from 101 to 73. Let it be understood that it is not all F.H.'s that are to be made into F.F.H.'s, but only a slightly increased proportion to the number of bearer companies now detailed.

Such a multiplicity of duties might tend to over-work, and consequent neglect of patients, but it is not to be continued for many days. After the first day and night it will be possible to get field hospitals up, or transport some of the wounded, and the risk of over-work on the one day is practically the only set-off against a mobile organisation that will take charge of a wounded man from the time he falls till he can be handed over to a regular hospital, and between those two periods he will be given not only surgical aid—as now—but ill-effect from exposure will be considerably reduced. The latter is sufficient of itself to justify much more than is asked for on this occasion.

The equipment will be that of a bearer company with such hospital stores as are considered suitable, and these hospital stores are to be carried in the ambulance wagons or ambulance carts if it is not possible to carry sufficient by 2 G.S. wagons that might be exchanged for the

2 forage carts the bearer company has now. The addition of another water-cart would be advisable, then the F.F.H. could pitch anywhere, irrespective to a great extent of an adjacent water supply.

Some suggestions are made in favour of other plans for a F.F.H. camp, which is a temporary one, and if it should be made stationary there will be time and opportunity later for re-arrangement.

A diagram of a dressing station has not been made, for it is but one O.P. tent, and the wounded are placed in front between flags, severely wounded one side, slightly wounded the other, till wagons could transport them. The operating tent is here the only shelter, and even that can hardly be said to be available for sheltering wounded. If the bearer company's tents and wagon tilts were used, there is very little to save men being exposed to the cold and rain.

Such an amalgamation as I advocate here will, I submit, repay all the trouble it takes many times, and moreover, it is quite practicable. Were the re-arrangement a thousand times more difficult, the scheme would be well worth a trial, for the sake of some of those poor fellows who receive wounds in our country's cause.

I fully appreciate the compliment of being invited to read a paper here, and I trust that my remarks, merely theoretical as they are, will be thought worthy of criticism and discussion by those who know. It is from discussion that good will come.

APPENDIX.

Some suggestions for training men for field work generally (and for first class bearer's grade, as proposed in foregoing paper):—

All to be under skilled, practical supervision; and *after* men are fairly well grounded in movement set forth in manual, where possible, to be practised in drill hall or a barrack square, as well as in the field.

Stretcher Drill.

Squads to work independently.

a. At instructional parades, instead of placing the patients in line, they can be placed in all directions; or radiating as spokes of a wheel.

Such arrangement will compel *individual attention* of all, since there will be no chance of watching what the right squad do, and copying their movement as well as merely taking the time from them.

b. The same drill with patients, but with tallies of a general nature, calling for decision as to the treatment of wounded, and the method of removal (1) by stretcher, (2) by hand seats, (3) leading by one bearer; improvisation to be encouraged.

c. Same drill, but with reduced number of bearers to each stretcher.

At first the squads could work with all the same numbers; afterwards one or two could be fallen out of alternate squads, on an intimation by the instructor that the bearer was wounded.

No. 4 would decide whether to attend his own man or proceed, according to injury.

d. Use of improvised methods. Decision to be given as to efficiency of such improvisation, and advantage to *or* likely to cause harm to the wounded. In the drill hall, but more particularly in the field, where the use of hop poles, hurdles, oars from boats, sacks, etc., could be used (or proposed to be used).

Bandaging.

Practice in securing same without pins.

Practice with Actual Stores.

a. To teach where they are carried, and what is carried in B.C. and F.H. equipment.

b. The making up of loads (under A.S.C. Instructor) for conveyance by cart, wagon, mule, boat, train.

c. What stores are first to be left behind. How stores are packed for transport in the field.

d. Complete explanation of details of construction and fit out of ambulance wagon and cart.

Any facilities that may be arranged for carriage of special cases, *e.g.*, to prevent jolting to a patient with injured spine in wagon, ambulance cart, train.

Actual practice in transference of B.C. or F.H. stores from or to wagon, boat, train.

Schemes that have been used for obtaining protection from weather. Bivouacs, regulation forms, use of wet cloths, wagon covers, sails of boats.

Methods of Cooking

Authorised—as field kitchen, flying column trench, flying column wall trench, etc.

Not authorised—but used by gipsies and kaffirs.

The former could be illustrated by a large box of sand, and models made to scale.

Field Work.

Elementary lectures and practice dealing with maps, and methods of indicating features—such as hills, valleys, rivers, etc.

Practice on the ground, as at Wimbledon, where the amount of cover for single bearers, stretcher-squads, wagons, could be shown.

Sergeants might be taught the theory of billeting, in order to enable an approximate estimate of house shelter available.

Some knowledge of signalling. A very few semaphore signs would be sufficient to direct the bearer to the right or left; to recall, etc. (Bugle would not be allowed to sound, I think, during an action.)

At Regimental Sports.

Victoria Cross prize on the lines of the Cavalry Victoria Cross races.

All No. 4's of each competing squad to have a large letter or number on their chests (in white or black).

Marks given for the short exposures or non-legibility of such label.

Judges to be some distance from starting-point—as enemy.

No. 4 to proceed alone, dress dummy wounded, signal for 1, 2, 3, and stretcher, whose method of advance and retiring would be counted, *e.g.*, it might be possible for the stretcher-squad to double out across the open; but for returning any fold of ground should be used.

Major V. MATTHEWS, R.A.M.C. (Vols.):—In the presence of so many gentlemen who have gone through active service, I am rather diffident of making any remarks; but if I may be permitted, just by way of starting the discussion, to say a few words, I will do so. It seems to me that the idea of the bearer company and the field hospital working as an amalgamated body is a good one. They are units that ought to work in unison, and it would be a great advantage if they were worked under one command. The actual numbers is a matter which must be determined as the result of actual experience. It is impossible, I think, for anyone theoretically to settle the numbers. I think, however, that there should be an increase rather than a diminution in the numbers. A field hospital is necessarily a high-pressure institution, working like a large casualty ward which has great stress thrown upon it, and surely it is desirable that they should get as much help as possible. For this purpose I think there might be a slight increase in the medical officers in both the bearer company and the field hospital. Assuming now this amalgamation on the present scale, with the bearer company, as it is and the field company as it is in the Manual, I would suggest that it might add to its efficacy considerably if it was divisible, and divisible in two ways. The bearer company would then become the transport division, and the field hospital, as it were, the field hospital division of this "First Hospital," to adopt the author's nomenclature. I think it would be advisable if it were also divisible in another way, half a transport division and half a field hospital division for this purpose. I would add to the transport division a medical officer, a quarter-master, and a transport officer, and to the hospital division one medical officer—that is to say, the fifth medical officer to command the whole of the unit—a quarter-master, and a transport officer. In whichever way the unit was divided, there would be an equal number of medical officers with each, a quarter-master with each, and a transport officer with each. I think, Sir, considering the amount of work thrown upon medical officers in the field, they ought to be relieved of this matter in connection with transport and equipment. Some re-adjustment of loads would be required, but not very much. In the present Manual it is already stated that the field hospital is divisible, and it prac-

tically is so with very little alteration. There is a point in the paper about the number of bearers which the author would employ in the "A" First Class Ambulance. It seems to me that every bearer ought to be sufficiently trained to render first aid. In addition, I do not see why they should not use the whole of the 32 men, that is to say, assuming the conditions to be such as he has stated, that the men must work individually. Each man also would have to carry a surgical haversack and water-bottle. I would suggest also for the training of such a unit that it would be very desirable in peace that a certain number of officers and men should be trained as field companies. The field companies of the Royal Engineers do special work of this kind, and surely for a medical unit this is a kind of special work. It must be backed up with some practical knowledge and experience. I think if perhaps we could—I do not mean men going out for simply one day with a field hospital—but if they could go and live with it, and find out where all the equipment is kept, and how to use it, and pack it and unpack it, much on the lines that the author has suggested, it would add to its efficiency. With regard to the signals at night, the five red lamps, it seems to me that the chief objection to that suggestion is the number of lamps which are required. I should think it would be better if the single civilian red lamp might be used alone.[1] It has also occurred to me that some temporary protection might be given to the wounded on the field of action, and say at the dressing station before they are taken care of, by means of umbrellas. Umbrellas might be introduced for the purpose of protecting the wounded. I hoped to have had an umbrella here to show you to-day, but will take an opportunity of showing it on another occasion. I hope you will not think me presumptuous in offering opinions of this kind, when we have so many men from the front present.

Lieut.-Colonel SQUIRE, R.A.M.C. (Vols.):—I feel it is hardly right for me to take up any time, since there are others far more competent than myself, and with much more practical knowledge, who could discuss this paper as it deserves to be discussed. I will, however, take the opportunity—and I am glad to have the opportunity—of congratulating the lecturer on having brought forward a paper of such importance. The principle underlying the paper, the idea on which the whole paper is based, I take to be this: that it is undesirable to move a wounded man from the field, where he falls, more than is absolutely necessary. As the author himself has expressed it, a wounded man should not have to be carried any distance, but rather the operating tent and hospital tent should be brought right up to the spot where the greatest number of casualties are. I take it that that is a principle with which we all absolutely agree. The difficulty is in carrying it out under the extremely awkward conditions, to say the least, of an engagement. But there is no doubt in the mind of anybody that if the assistance could come up to the man where he falls, instead of his having to be jolted, as he must be, in a rough cart a long distance before he can be looked after, it would be a very great advantage, and the principle is one of the very greatest importance. There is so little time for discussion, that I must leave consideration of details to the practical men. I would remind you of the tortoise tent which was invented some years ago, a wagon carrying on its back a cover which can be thrown out so as to make a sufficient protection for many men, either with the wagon left in its place, or taken away leaving the tent behind. That was designed with the idea of bringing assistance up to the wounded rather than of having the wounded brought back to where the field hospital was placed. I have very little doubt that

[1] Of course I mean by International arrangement under the Geneva Convention.—V. M.

the principle of bringing assistance up to the wounded might be carried out, by providing "tortoise" covers to the ambulance wagons of a bearer company so that they might be taken on to the field and there pitched as temporary field hospitals, or by amalgamating the two units, as proposed by the author. He has mentioned another point of some practical value if it can be carried out, namely, that the men of the bearer company might singly, though not in groups, be able to render such immediate assistance to the men as they fall as to prevent them bleeding to death, for example. They might be usefully employed in this way, as the author has suggested; and when the fire has slackened, it might be possible to collect the wounded men into groups, making a number of small field hospitals dotted about, with a central operating tent to which the more severe cases might be taken without a great amount of moving. The question is one of detail, and although the subject is, I feel, of very great importance, it is hardly one that we could have expected to have interested a very large number of people. The importance of the subject, however, is to my mind sufficiently great to make it quite worthy of some discussion by experts, many of whom I see here. I should just like to mention one detail with regard to the lamps. I feel that there is a difficulty in carrying about a great number of lamps, but it occurred to me that possibly it might be arranged to have a sort of glorified Chinese lantern, if I may so call it, a cube of transparent material, with the red cross on a white ground on each side, which, with a good light in the centre, would indicate the Red Cross flag by night, and which would show as well as an ordinary flag during the day.

Lieut.-Colonel H. E. R. JAMES, R.A.M.C. :—I am afraid I have not very completely studied the paper, but there are certain points that have been mentioned which I should like to comment upon. The proposals put forward are not quite what I expected from the advertisement of the paper; that is to say, the amalgamation of the present units of the field hospital and bearer company as they exist, which measure is under consideration, and I believe there are certain objections to it. First of all, with regard to the tents, I believe that the bell tent is quite a thing of the past, or is going to be. Its only advantage is portability. Its disadvantages one need not dwell on. I believe the best tent for the purpose would be the one which they use in Canada. It is a tent so constructed that you can amalgamate it into a series of tents, and it has the advantage of being very portable. It has all the advantages of the operating tent proposed by the lecturer, and the additional advantage that the ends can be opened into one another. The ridge poles are made continuous, so that you can get a great deal of accommodation out of a comparatively small number of tents. With regard to the suggestion of the ambulance coming to the wounded, and the wounded not being carried to the ambulance, I think that that would only be capable of very limited application, because people nowadays have to fight over a very extended area. If you were to have the wounded widely distributed, and a number of collecting stations instead of one, it would greatly add to the difficulty of administration; and certainly in anything like savage warfare it would be very much to the prejudice of the chances of the wounded in the way of people wandering about and killing them. I do not think it would be applicable in most of our wars. The idea that strikes one as being the most practical, if the amalgamation question is to be considered, is to have a very large number of untrained or half-trained bearers, who could be charged simply with the carrying of the wounded, so as not to waste our highly-trained orderlies, who would be of use in hospitals. You might have one man who was fairly well trained to four of the others. With regard to the subject of the pitching of the hospital, it seems to me that the present plan cannot be very much improved upon. Theoretically, the field

hospital is always within a day's march, a manageable distance for transport from the fighting line, and the people who are left in the field hospital can pitch it very comfortably and prepare it for the wounded who will be brought in. I do not see myself very much advantage in fetching the hospital to them, because the spot where fighting has been going on quite likely would not be a very eligible place for a field hospital to be pitched upon. One of the great conditions which decide the position of a field hospital is that it shall be on the line of communication and near a road, in order that the transport may get near it. Therefore, the site for the hospital should be deliberately chosen, but it probably would not be at a place where there was a battle. With regard to signals and flags, which are two distinct questions, the flag shown in the second diagram on the right-hand side has already been adopted as a day-time distinguishing flag, and it is found, I think, to work very well. With regard to night signals, the single red lamp which was suggested as the signal for the medical establishments I believe is the particular private lamp of the general officer commanding, so I do not think we could go for that. The two white lamps side by side, and generally hoisted fairly high, might be improved upon: but I think until now they have been found sufficiently distinctive. Perhaps some of the officers who have been to the front may be able to throw more light upon the subject. On the whole, I think the system of amalgamation is distinctly good, especially that the senior officer shall be the officer who is in command of the field hospital and bearer company unit together, and that he shall remain, until the wounded begin to come back to hospital, in executive command, and shall be in every way responsible for the movements of the bearer company—that that, in fact, is his advance body, and that the field hospital is its support. The way in which operations are conducted at Aldershot is simply a pattern. I am afraid it has been taken too much for a rigid and standing plan, outside of which nothing must be done. It is merely intended as a pattern, and any officer, when it comes to actual fighting, would be able to modify it to any extent. With regard to the training of these people, no doubt it is a most valuable thing, as Colonel Matthews suggested, that they should be with their equipment and not separated from it, thus being able to practise and live with it. That is only to be attained at manœuvres. The whole thing is a matter which requires a great deal of experiment in a practical way, and I should be sorry to see any plan accepted finally without a very considerable amount of trial.

Major O'CALLAGHAN, R.A.M.C.:—I had not intended to say anything on the subject, but my interest in it is so great, having commanded a bearer company in the present campaign, that I should like to say a few words. There is one thing I should like to say before I forget it. Major James mentioned the question of lamps. Any man on active service knows the great difficulty in obtaining and keeping intact one lamp, and the oil with which to furnish it. That is one of those little practical points which crop up in a campaign. As regards the amalgamation of the bearer company and the field hospital, it practically at present exists. We have now come to the parting of the ways, and as long as we keep up the ambulance and the present Red Cross, it is impossible for us to carry out, as Major James remarked, the rigid training which we sometimes go through. It is impossible to push your dressing stations up near the line of fire, because no general nowadays will allow the Red Cross to be in any proximity to his guns or troops, because that enables the enemy to say he is covering his troops with the Red Cross. Therefore, at present, with the high velocity guns, and the long-range fire, it is impossible for the bearer company to act according to the traditions of the Service, that it is practically an amalgamated field hospital and bearer company. If the man in command of the field hospital is senior officer, he

commands the two, and practically they work together throughout. The chief objection to the lecturer's paper is his statement in connection with putting stores into the wagons. That is one of the most fatal objections to his theory. Every medical officer who has had these wagons knows that that is one of the greatest curses of the bearer company. In going into action it is crowded with men, sick and wounded, because the field hospital has no transport of its own. I think certainly that the field hospital should have had wagon convoys or ambulance convoys, by means of which it would have been enabled to carry the wounded, if necessary, or to send back convoys, without eternally wearing out the transport of the bearer company. I want to point out that if the bearer company is worked under the Red Cross, it must work with the field hospital—they go together. The wounded will never be removed in a large action—I am not talking of some of our more severe actions in South Africa, where we had so many hundred casualties, but I mean a European battle, where we may have 10,000 men wounded in ten minutes. If we cannot get at the men and help to clear them away till night, I do not know when our work will be done. At the same time it is a question whether, if we stick to the Red Cross, and if we do not form a separate unit, which shall be more or less without a Red Cross, and without any protection whatever, except whatever protection the shape and formation of the ground will afford them, in fact, as long as we stick to the present system, I think the amalgamation is quite sound enough for all practical purposes. With regard to the remarks which have been made on the question of training special bearers, I would like to ask, How will you get your special bearers into the line of fire? A special bearer cannot walk more than a certain distance. Your field hospital or your bearer company cannot go except within a certain distance, and that may be 5,000, 6,000, or 7,000 yards, and under those circumstances how can your first eight bearers get up to the line of fire, and act without entirely losing touch with their own company?

The CHAIRMAN :—On which side did you serve in South Africa?

Major O'CALLAGHAN :—I served in the Orange River Colony.

Rev. G. R. FLETCHER :—Anyone who is interested in this question should study the Austrian Regulations, as that Service has the amalgamation that has been spoken of to-day. I cannot go into detail, as I speak from memory, not having been in touch with military medical matters just lately, but I believe the members will find in the library two books which treat upon the subject. One has a translation interleaved in it, and describes the medical work of an Austrian Division in the field, and the other in three volumes on "The Medical Service in War" (Austria). These books give a great deal of information on the practical side of the subject.

The CHAIRMAN (Colonel W. L. Gubbins, R.A.M.C.) :—I am sure you will agree with me that the lecturer has conferred a benefit in bringing forward this very important subject of the amalgamation of the bearer company and the field hospital. In 1899 I happened to be at the War Office, and I am not divulging any secrets when I state that this very subject was under serious consideration. The then Director-General, however, decided on the old principle of "not swapping horses when crossing the stream"; to let the matter stand over and reap the benefit of the experience of the campaign on which we were about to enter. He also gave instructions to certain principal medical officers to study this very subject. I will now take the remarks of the gentlemen who have spoken *seriatim*. Major Matthews concurs in the suggestions with regard to amalgamation. He desires to increase the medical officers; he also wishes an additional quarter-master and transport

officer. He mentions a single lamp, and also umbrellas. With regard to the amalgamation and the increase of medical officers, I think most of us are in favour of the amalgamation motion. As to the increase of officers, I very much doubt if that would be practicable; in fact, I think the tendency would be to reduce the quarter-master, although I know my friend, Captain McCullum, whom I see present, holds very strong views on that subject. Where we want quarter-masters and non-commissioned officers is not so much in the field hospitals as in the general hospitals. As to the transport officer, I do not know whether he is aware that at present, in European warfare, there is a man who represents the transport. In South Africa we had civilian conductors, men picked up in the colonies, and they worked very well on the whole under the commanding officer of the unit. With regard to umbrellas, I think there is a good deal to be said in their favour, and I hope we may have the opportunity of seeing one some day. On the Nile in 1898, I remember we sent up two or three hundred stretchers with hoods attached to them, which were of great use in sheltering men from both sun and heavy dews. Colonel Squire alluded to the difficulty of pushing up field hospitals, however desirable it may be. I quite agree, from my experience, with Colonel Squire, tents are very apt to draw fire. I do not know how it is, but in South Africa they did draw fire; not that the Boers had any intention of firing on a hospital. There is something to be said in favour of the Chinese lantern with a red cross on it which Colonel Squire mentioned, but Major O'Callaghan alluded to the great difficulty, which I know exists, of keeping a lamp intact at all, that was one of our greatest difficulties in South Africa. Colonel James said he hoped bell tents were a thing of the past. Herein I heartily agree with him. I have had a most painful experience with bell tents. Colonel James also alluded to the Canadian tents. I hope we may have an opportunity of seeing one. We want very much a similar tent for a field hospital. I also entirely agree with him that the ambulance cannot be brought up to the wounded; the wounded should be brought to the ambulance. With regard to night signals, I think the present are quite sufficient, provided we can keep them intact: that is the great difficulty. I was glad to learn that he agrees with the amalgamation, which I think is the general sense of the meeting. I was also very glad to hear him state that the instruction given at Aldershot was only a guide, which could be modified to suit circumstances, and that no hard and fast rules exist there. He also alluded to manœuvres. There is not the slightest doubt that Sir Redvers Buller in Natal was very fortunate with his hospitals. He had nearly all the officers and men who were trained on Salisbury Plain in 1898 and 1899. They belonged to the original army corps that went out and were the pick of the basket. The manœuvres were, I repeat, of the greatest possible advantage to everybody. Major O'Callaghan objects to the conveyance of stores in wagons. Here I cordially agree with him; one of the curses of campaigning is the practice of shooting all kinds of stores, legitimate or illegitimate, into ambulance wagons. He also spoke about field hospitals having special wagons for conveying the wounded to the rear. I have had a good deal of experience in South Africa with the ordinary buck wagons, and it is astonishing what a great deal can be done with them. You have heard a great deal of harsh criticism of the medical staff in connection with the war—of wounded being put into and jolted in ox and buck wagons. If any gentleman in this room were placed in either an ox or buck wagon, he would be astonished at its comfort. In the recent action at Brakenlaagte, the wounded, as a matter of fact, were nearly all sent back in these wagons. There were not sufficient ambulance wagons to go round, and I do not think they suffered unduly; in fact, colonials will tell you there is nothing more comfortable than an ox wagon. Now, ladies and gentlemen, I have dealt with all the different people who have spoken on the paper. I am going to make a few remarks, and I hope you will not

think me egotistical. I have had the advantage recently of serving nearly two years in South Africa. I happened to be P.M.O. of the Sixth Division, so that I have seen several field hospitals at work. Dealing with the lecture, the author proposes to call his hospital the first field hospital. Personally I am rather against that. I am very much in favour of reverting to a term of old days—field ambulance. I dare say the word "ambulance" is used in a very elastic sort of way: a great many people think the term "ambulance" means wagon—they should say "ambulance wagon" to be correct. Before coming here, I opened Murray's Dictionary to see the definition of the word "ambulance." He defines it as a moving hospital which follows an army in its movements so as to afford the speediest possible succour to the wounded. My suggestion is to call this combined unit—I may tell you parenthetically that I am absolutely in favour of it—a field ambulance. The lecturer spoke about re-arranging the equipment. There I agree with him, but it will be quite time to arrange that equipment when the amalgamation is decided on. The proposition with regard to the stores, as I have already said, is not sound—in fact, it would not work. There is one other thing that struck me, namely, that in talking about succouring the wounded at the front the lecturer seems to have entirely ignored the regimental medical officer, the sixteen regimental stretcher-bearers, and the first field dressing. Nearly two years ago I happened to be present at the battle of Paardeberg, where we had 800 wounded to deal with in one night. If it had not been for the regimental medical officer, the sixteen stretcher-bearers, and above all the first field dressing, we should have been in a very bad way. The men were instructed how to put on first the field dressing, and an unwounded comrade helped a wounded one; so well was this dressing applied, that when the wounded man arrived at the field hospital we did not in many instances disturb it. These are points the lecturer has ignored, unwittingly, of course. I cannot tell you how they have helped us. It is impossible for any bearer company to cope with the wounded of his brigade; you must rely on the regimental medical officer and the regimental stretcher-bearers, who are very useful men. After a time they take an interest in their work and get to be quite efficient. The lecturer also alluded to what he called first-class bearers. I do not see any necessity for them. We have already a division of first, second, and third-class orderlies, and granted that we have an amalgamation—a field ambulance for brevity—I think it rests with the medical officer of the unit to select which men will be bearers, and which nurses. Some are better as nurses, and some are better as bearers. The best male nurse I ever met in my life was not a R.A.M.C. man but a private in an infantry regiment. That man was a born nurse, so I think in every amalgamated unit you will find some men more suitable for one kind of duty and some for another. The Red Cross light we have already dealt with. One point I noticed in South Africa was the scarcity of Red Cross flags. A certain number were sent out, but they got lost or worn out. We require six times the number of flags, particularly those on long bamboo poles when an action is going on, in order to guide the wounded coming in. When you are sending back your ox-wagons or wheeled transport to the rear, if you have not any flags you have to improvise them. The cry in South Africa was for "flags, flags"; we had not half enough of them. With regard to the *personnel*, I would keep the combined *personnel* as it is at present, namely, eight officers, including the quartermaster, and 94 non-commissioned officers and men. It may appear that there are too many medical officers. No doubt there are, but casualties are always occurring in regiments. I have had to replace three officers myself in one day, and where did I take them from? From the bearer company, or field hospital. I would not reduce the medical officers below this number. Not only do you want them to replace casualties, but when you send convoys to the rear you must attach a medical officer to them. If

I did reduce the *personnel* at all I would make a reduction of one warrant officer and probably a few non-commissioned officers, and send them to the general hospitals, where they are very badly needed. With regard to the bell tents, as I said before, I cordially agree with Colonel James as to its unsuitability, and I hope it will soon be a thing of the past. As to the operating tent, I am rather personally interested in it, because in conjunction with an ordnance officer I had the pleasure of designing it seven or eight years ago. On the whole it has acted very well for its purpose; but at the same time I do not think it is quite a suitable tent to treat sick in. I would like to devise a tent of our own or to see this Canadian tent of which Colonel James has spoken: but the operating tent had better be kept as it is. There is another point that I would very much like to see taken up, namely, the question of beds. When we are organising an expedition we talk of a field hospital with 100 beds. The use of the word "beds" in connection with a field hospital is rather misleading. They are not beds. The man simply lies on the ground on his waterproof sheet or blanket, and you may have five or six or nine men in the tent. I contend they should never be reckoned as beds. I look on a field hospital as a temporary place to detain the men until you can transport them to the general hospital, which is their proper place. I hope when we come to revise our field medical service that this question will be seriously dealt with. As to the advantages of combining the units, I think everything is in its favour. I have met very many medical officers in the Orange River Colony and the Transvaal and also at home, and I can say that 90 per cent. of those I consulted were entirely in favour of the amalgamation. The odd 10 per cent. simply had not studied the question or had not made up their minds. Another advantage in having one unit is that you would only have one set of returns. Returns are a curse anywhere, but they are the greatest curse of all on the field. The commanding officer is a very important individual. He should be the senior medical officer of the brigade. The second in command should be the next senior. As the commanding officer may go ill or get knocked over, or unavoidably absent, I think that is a practical suggestion. This officer should be either a lieut.-colonel or a major. In order to insure his being the senior officer of the brigade, I would always put young officers, captains and lieutenants, to the regiment. When we organised this expedition I happened to be at the head of the mobilisation branch of the War Office. The late Director-General wished to have one senior officer in each brigade with a regiment. That was all very well; but we found after a time that the senior officer was wasted there. The medical officer was rather apt to clash with the field hospital, if he happened to be the senior. There is no doubt the regiment is the proper place for captains and lieutenants. They are younger, have more go in them and hit it off better with the regimental people. A senior officer is very much more wanted in other places. If you have the bearer company and the field hospital separated there is wont to be constant friction. I will not say it is intentional, but it nevertheless exists, although the two commanding officers may be privately the best friends in the world. You must have one in supreme command, and you can only have that by amalgamation. When I left South Africa practically every column had a combined medical unit. These remarks are emphasised by what Major O'Callaghan has stated. They are, in fact, miniature field ambulances. In fact, it could not be otherwise. With regard to the historical point and the question of sending men back in wagons, I would advise you to read the life of the late Sir James McGrigor, the father of the Army Medical Department, who was one of the first to use ordinary wagons in the Peninsular War. From my experience there is a good deal less suffering in wagons than people imagine. There is also a great tendency to think that

all this suffering is avoidable. It is not. Everybody does his best. We must bear in mind as medical officers that a general's first business is to win his battle and finish the war. That is best for everybody. I had the privilege a short time before I left South Africa of talking to a very distinguished general officer. I asked him where he would put medical assistance in his category; he said "I would put first the ammunition, then the food, and next the hospital supplies." Personally, I was inclined to put the food before the ammunition, but he said "No; ammunition first, then the food and then the hospital supplies." I think the general was right—he is the best judge of the respective merits of the food, the ammunition, and the medical supplies; it is preposterous for us to say that hospital stores are to have precedence of everything. Let us be reasonable and let us by all means do everything we can to succour and mitigate the sufferings of the sick and the wounded and prepare in peace for what we will have to do in war. We owe a great deal to the author for having brought forward this subject, and I hope it will bear fruit.

General Lord CHELMSFORD, G.C.B., G.C.V.O.:—As Chairman of the Council of the United Service Institution, I wish to convey their very best thanks to Staff-Sergeant Stapleton for his interesting lecture, and to Colonel Gubbins for presiding on this occasion. We all must feel that the care of the sick and wounded is one of the most important points of a soldier's duty. Of course it devolves upon the medical profession to see how that can best be done, with due regard, of course, to the interests of the combatant branches. I have always contended that the medical officer has much more opportunity of showing calm, cool courage, so far as exposure to bullets is concerned, than any of us who have to lead our men under fire. There is no profession that we all feel so grateful to as the representatives of it who have been here this afternoon, with the object of endeavouring to improve the assistance which is given to the wounded in battle.

THE DOCTRINE OF CONTINUOUS VOYAGE: ITS ORIGIN AND DEVELOPMENT FROM THE SEVEN YEARS' WAR (1756) TO THE BOER WAR.

By Lieutenant A. G. LEECH, R.F.A., Barrister-at-Law.

I.

AMONG the various questions of International Law which have presented themselves during the war in South Africa, there are two or three which may be deemed of such importance as not only to demand the attention of the student of International Law, but also to arouse the interest of the individual known as the "man in the street," whose intelligence, though lately somewhat over-estimated, can readily grasp the problems suggested by the simplest and least technical branch of Law. I refer to such questions as those connected with military occupation, the methods of suppressing guerilla warfare, and the doctrine of continuous voyage, or ulterior destination, as it is sometimes called, in connection with contraband of war. It is with the last of these that I propose to deal in this paper, giving a brief account of its origin and development, and of the differences of opinion which exist on the subject, and pointing out the peculiar and interesting form which it has assumed under the circumstances of the recent conflict.

The doctrine, though really a little older, is generally dated from the war of 1756 between France and Great Britain. At that time the French fleet, having suffered defeat at the hands of the British, was compelled to withdraw from the high seas. France was therefore unable to maintain communication with her colonies and to protect her colonial trade, which was carried on solely in French vessels, and in this emergency she threw it open to the Dutch. But the British authorities subjected Dutch vessels to the same treatment as the French mercantile marine, alleging as their reason the "Rule of the War of 1756." This rule laid down that where a colonial or coasting trade had been exclusively limited to the country to which, in time of peace, such trade rightfully belonged, that trade could not be thrown open to a neutral in time of war; such action was presumed to have been induced by pressure resulting from the war, and was deemed to be a mere device for the protection of the trade in question.

The rule was extended about the year 1793, during the war between France and England, which followed on the French Revolution. The circumstances were similar to those of 1756, except that in this case France threw open her colonial trade to neutrals indiscriminately, a proceeding to which Great Britain took exception. The leading case was that of the "Immanuel" (2 C. Rob. 186), a Hamburg ship trading between that town and St. Domingo, which, touching at Bordeaux, sold there part of her cargo and took other goods on board. She was seized by a British cruiser on the ground that she was engaged in trade between an enemy port and one of the colonies belonging to the hostile country.

Sir William Scott (afterwards Lord Stowell), in giving judgment, laid down the rule that all neutrals, on the outbreak of war, might carry on their ordinary trade subject to the usual restrictions, viz., that they might not carry on trade with blockaded ports, or deal in contraband of war; but that the case was very different when it came to the opening up to neutrals of a trade which, before the war, they had never enjoyed. The learned judge therefore condemned that part of the cargo which had been shipped at Bordeaux on the ground that, although neutral property, the cargo was going direct from an enemy port to an enemy colony; and further went on to say that had the goods been contraband, the ship itself would have been liable to confiscation.

The attempt to evade this rule practically introduced the doctrine of continuous voyage and the device employed was simplicity itself. Neutral vessels, trading between the colony and the mother country, used merely to call at some intermediate neutral port, pay dues on the whole or part of their cargoes, and proceed upon the voyage. This practice did not find favour with the English Prize Court, which held that the intermediate port of call was only a colourable destination, and intended as a blind to cover the trade which was in reality being carried on between the colony and the mother country. The Court further went on to say that, in cases where there was a distinct intention from the beginning of the voyage of conveying the goods from the colony to the mother country, the voyage would be treated as one, and the ship and cargo would be held liable.

The first important case which illustrates this point was the "William" (5 C. Rob. 385 temp. 1806), a neutral vessel trading between La Guira, a Spanish colony, and Marblehead, a port in the United States of America, during the war between Great Britain and Spain at the beginning of the last century. On arrival at Marblehead the cargo was unshipped and all duties paid. The greater part of the same cargo was then replaced on board the vessel, and she sailed for Bilboa in Spain. The ship was captured by the British, and the whole of the cargo which

had been shipped at La Guira was condemned, on the ground that the mere colourable landing and paying of dues at the neutral port did not create sufficient reason for the belief that the goods were being imported into America, and that the voyage being practically continuous from La Guira to Bilboa contravened the Rule of 1756.

The next case of interest on the subject—that of the "Commercen" (1 Wheaton, 382, temp. 1812)—presents some peculiar and striking features. At this time Great Britain was at war with the United States, and was also carrying on a campaign against France in the Spanish Peninsula. The "Commercen" was a Swedish vessel carrying a cargo of barley and oats for the British troops in Spain. She was seized by an American cruiser on the ground that she was a vessel in the employment of a nation at war with the United States, and that, though not actually carrying supplies for the troops operating against that country, still her cargo consisted of forage destined for the support of British soldiers. The fact that the destination of the vessel was a neutral port was deemed to be no bar to the confiscation of the cargo, seeing that its real destination was to the army of the enemy.

During the long peace which followed the Peninsular war, nothing, as a matter of course, was heard of this doctrine. In the course of the Crimean campaign, the case which re-opened the discussion and again brought the question into prominence was that of the "Vrow-Howina," a Hanoverian merchantman, which was stopped by the French while on a voyage from Lisbon to Hamburg on suspicion of being engaged in an illegal traffic in contraband of war. She had, in fact, on board 973 sacks of saltpetre. The contention was that, though bound for a neutral port, her destination to Hamburg was merely colourable, and that she was really chartered to convey her cargo to some Russian port in the Baltic. The grounds for this belief were apparently sound; for it was a matter of public notoriety at that time that Hamburg was the intermediary port used for the transmission of large quantities of warlike stores to the Russians, and that these materials, though usually sent through that town in a crude condition, were ultimately destined for the use of the armies of the Tsar. The vessel was accordingly condemned by the French Prize Court.

In the American Civil War of 1861-65 the question commenced to assume much larger proportions, and began to receive the serious attention of the leading Continental and American jurists of the day. It will be sufficient for the purposes of the present article to touch upon one or two of the leading cases bearing on the subject, the most notable of which were the "Stephen Hart" (Blatchford's Prize Cases 387), the "Springbok" (5 Wallace 1), and the "Peterhoff" (5 Wallace 28). The two latter are, perhaps, the most important and most worthy of notice.

The "Springbok" was an English vessel bound from London to Nassau, a British port in New Providence, with a cargo composed chiefly of innocent goods, but having on board a number of contraband articles. She was seized by the United States cruiser "Sonora," and taken to New York, where the Prize Court subjected both ship and cargo to the penalty of confiscation.

Betts, J., in the course of his judgment, laid down that, from the moment a vessel left a neutral port having on board contraband of war destined for the enemy, such vessel and cargo were liable; that part of the cargo being contraband infected the entire contents of the ship, and that the discharge of the cargo at the neutral port for its ulterior journey to the enemy's country did not protect the property.

The case was taken before the Supreme Court of the United States, which reversed the decision of the lower Court as regards the ship but confirmed the former ruling as to the cargo, not because the goods were contraband, but on the ground that the entire cargo was destined for a blockaded port.

The decision in this case having met with general disapproval in England, the opinion of the Law Officers was taken on the subject. The law officers at the time were Sir W. Atherton and Sir Roundell Palmer (afterwards Lord Selborne), who gave their opinion on the part of the Government, while the owners consulted Mr. Mellish (afterwards Lord Justice Mellish) and Mr. Vernon Harcourt. These eminent lawyers all concurred in thinking that if the goods were destined to be sold at Nassau, and if the voyage was the honest voyage of a neutral vessel from one neutral port to another, then neither ship nor cargo would be liable; if, on the other hand, it was the intention that the goods should be sent on to a belligerent destination, the vessel and its contents might with justice be condemned. They considered that the evidence adduced of this intention was insufficient, and that therefore the condemnation of the cargo by the Supreme Court was wrongful and in violation of the principles of international law. Thus it appears that the principle of the doctrine in question was for the first time admitted to be sound by four of the most eminent jurists of Great Britain, who based their condemnation of the American view, not on any objection to the doctrine, but rather on the insufficiency of the evidence.

The case of the "Peterhoff," which came up for decision about the same time, is still more interesting for our purpose, being more nearly parallel to the circumstances under which the question arose in the late Boer war. The "Peterhoff" was a British vessel voyaging between London and Matamoras, which was a neutral port on the Mexican side of the Rio Grande. The cargo was partly contraband, and the captor of the

vessel, a Federal cruiser, sought its condemnation on the ground that the goods were intended to be forwarded up the river to the enemy.

Betts, J., in giving judgment, after reviewing the facts of the case, laid down that the voyage was not the honest voyage of a neutral vessel to a neutral port, and condemned both ship and cargo.

The Supreme Court, on appeal, reversed the decision of the lower Court as regards the vessel, but confiscated that part of the cargo which was composed of contraband goods and also the innocent property belonging to the same owners. This practically amounts to a decision that contraband goods are liable to confiscation if there is ground for the belief that they are to be transported across neutral territory to a hostile country.

Having traced the history of the doctrine to the end of the American Civil War and shown how firm a footing it has secured in America, I propose in the second part of this paper to notice the marked differences of opinion which have arisen among the most eminent Continental lawyers as to this subject, and to consider the development and application of the doctrine to the circumstances of the recent South African conflict.

II.

In the earlier portion of this paper I gave a short historical sketch of the origin and development of this doctrine, noticing the various important cases bearing on the subject which arose from time to time, and showing how the question stood at the end of the American Civil War. The operations which took place during the great European wars which followed shortly afterwards being mainly conducted on land, the question did not come into prominence for some time, but the doctrine during this period was very freely discussed by the most eminent lawyers, both in Europe and America. In particular it received the serious attention of the members of the "Institut de Droit International," who appointed a committee, comprising the names of such jurists as W. E. Hall, F. De Martens (lately President of the Venezuela Arbitration Tribunal), L. Renault, and Travers Twiss, to consider the subject. The report of this committee, which condemned the doctrine, was accepted by the Institut.

Mr. Godfrey Lushington, in the preface to his manual issued by the British naval authorities for the use of the officers of the Royal Navy, puts forward the opinions held by the American Courts as opposed to those of the British, and finally weighs in the balance the reasons for their opposing views. He points out that the introduction of steam has greatly facilitated the carrying of contraband. In modern times a trader would have no hesitation in selecting, as his intermediary port of call, a port several hundred miles away from his real destination. The delay caused would be inconsiderable under present conditions, and the

consequent immunity from capture would more than compensate him for his loss of time; while, under the old conditions, when canvas was the only means of propulsion, the port selected would have to be much nearer to the hostile destination. He then proceeds to say that the older view, *i.e.*, that the destination of the vessel is conclusive of the destination of the cargo, is clearly in the interest of neutrals, while the opinion held by the advocates of the doctrine is in favour of the belligerent, aiding him to intercept contraband goods which otherwise would have escaped. He indicates his own view in the following passage:—"Judging by principle, the view of the belligerent seems correct. A neutral vessel which forwards munitions of war part of their way to their ultimate destination to one of the belligerents is really aiding and abetting in the war, and this on the high seas."

The doctrine, as laid down in the preceding paragraph, is gradually gaining ground and bids fair to be accepted ere long as an established rule of International Law. But it will be said with some reason that the interest of the neutral must also be taken into account; still, if the neutral seeks to evade the law by the mere trick of introducing a neutral port as a false and merely colourable destination, and the circumstances of the case raise a strong presumption that the goods, from the outset, were intended for delivery to one of the belligerents, then the other belligerent's right of capture ought clearly to be upheld.

At this point it is interesting to note that, within the last decade, the doctrine has begun to establish itself more firmly in the minds of some of the most eminent jurists of the day, so much so that the "Institut de Droit International," during their session held at Venice in 1896, reversed their decision of 1882 and accepted the principle. On this occasion the following statement of the doctrine was adopted:—"*La destination pour l'ennemi est présumée lorsque le transport va à un de ses ports, ou bien à un port neutre qui, d'après des preuves évidentes et de fait incontestable, n'est qu'une étape pour l'ennemi, comme but final de la même opération commerciale.*"

This view was opposed with vigour by the late M. A. Desjardins, who proposed to substitute for the last sentence the following words:—"*n'est qu'une étape choisie pour tromper les belligérants sur la véritable destination du chargement.*" He admitted without hesitation that his object, in proposing the amendment, was to create such difficulties as would bring about the rejection of the theory. The amendment was opposed by M. Fusinato on the ground that it would exclude the case of contraband goods destined for a neutral port, not with the intention of deceiving the belligerent, but simply because they were intended for delivery to the belligerent who did not possess a seaboard. Professor Westlake, of

Cambridge, supported by MM. Catellani and Buzzati, successfully opposed the amendment, and the resolution was adopted in its original form.

The question becomes more complicated when one of the belligerents, as in the case suggested by M. Fusinato, is without a seaboard and must receive its munitions of war through some neutral port, such as Lorenço Marquez. The doctrine has been objected to, in this case, on the ground that the belligerent, who has no seaboard, is severely handicapped from the outset, and is therefore unable to meet his adversary on equal terms. Why should the belligerent, who happened to be the maritime nation, have the right to seize contraband goods to the detriment of his adversary, while himself enjoying complete immunity from any such operation? The answer to this argument is, that the maritime nation is bound to defend its own interests and must be permitted to prevent its enemy from obtaining supplies of this nature. The advantage given to the maritime state by the recognition of the doctrine s balanced by the fact that the inland state is unassailable from the sea. The belligerent who possesses a powerful Navy is thus unable to bring its full strength to bear on his enemy in the prosecution of the war.

The feeling in Great Britain until lately has, as we have seen, always been against the adoption of the doctrine. In 1885, during the war between France and China, the French Government announced its intention of seizing vessels bound for Hong-Kong and laden with goods which had been declared contraband. The British Government protested vigorously against any such proceeding, on the ground that the destination of the vessel was conclusive of the destination of the goods and that it was open to any neutral vessel to trade to any neutral port.

The case of the "Doelwyk," a Dutch vessel captured in 1896 by the Italian cruiser "Etna," in the war between Italy and Abyssinia, presents an exact analogy to the cases which have occurred during the recent conflict. She was bound for the port of Djibouti, a French possession on the Red Sea. Her cargo (contraband) was condemned by the Prize Court sitting at Rome in December of that year, on the presumption that the contraband goods were intended for transport overland into Abyssinia. There can be no doubt that the circumstances of the case justified the decision of the Italian tribunal, for France was not, at the time, at war in any part of Africa, and it would be impossible to conceive any other reason for their conveyance to that port.

When the war in South Africa broke out, it was at once seen that the fact that the South African Republics were without a seaboard would lead to serious International controversy, and that Portugal, which possessed the intervening strip of territory, would be under more than ordinary obligations with respect to her dealings with both belligerents.

The question arose almost immediately after the outbreak of hostilities. On the 29th December, 1899, the German mail-steamer "Bundesrath" was seized in South African waters by the English cruiser "Magicienne," and taken to Durban. An energetic newspaper discussion resulted, the English Press holding that the "Bundesrath" had on board three German officers and twenty-one men who were going to fight in the ranks of the Boers, and that the vessel was captured outside territorial waters, while the German newspapers denied the presence of any such persons on board the vessel, and insisted that she was captured within the limits of the neutral zone, and that consequently the seizure was altogether illegal.

In the following month two other vessels, the "Herzog" and the "General," were seized, and detained on suspicion of having contraband goods on board, the former being captured near Delagoa Bay and the latter at Aden. The captors, in the case of the "Bundesrath" failed to prove that the vessel was engaged in un-neutral service, while the cargoes of the "Herzog" and "General" were found to be innocent. All three vessels were shortly afterwards released, and compensation was paid by the British Government. It is noticeable, as showing the progress of the doctrine, that in none of these cases was any attempt made to maintain the principle that the destination of the cargo was absolutely conclusive as to the destination of the goods. The discussion proceeded on entirely different grounds, and the silence of the German Government on this point may be taken as an admission that such circumstances as these present an exception to the general rule.

The doctrine has until lately been vigorously opposed by the great majority of International jurists as constituting an undue encroachment on the rights of neutrals; but the more modern view is, slowly but surely, gaining ground, and is establishing itself in the minds of the leading lawyers of the day. It would occupy too much space to quote the opinions of the various eminent jurists who have refused to recognise the doctrine; it is sufficient here to state that the weight of individual opinion is probably still against it. On the other side there may be quoted the opinion of that distinguished Swedish lawyer and member of the "Institut de Droit International," M. Richard Kleen, who, in his admirable work "De la Contrabande de Guerre," published in 1893, states his view as follows:—"Si . . . . . la destination *définitive* et *véritable* est un territoire ou une personne sous la juridiction *d'un belligérant*, ou ses armées, ses flottes, etc., la culpabilité ne saurait être diminuée parce que la destination *proche* ou *apparente* est un port neutre, ni parce que le navire fait escale dans un port neutre. C'est le *secours* qui constitue le délit de contrabande. Et ce secours reste le même, qu'il soit prêté directement ou indirectement, avec ou sans intermédiaires, arrêts ou escales. Lors

même que la marchandise serait déchargée en cours de route dans un port neutre, elle est de bonne prise s'il peut être prouvé que le but de l'expéditeur était de la faire parvenir à un belligérant.

"En conséquence, la neutralité est rompue par le transport d'un article de contrebande d'un pays neutre à un autre pays neutre, dès qu'il est prouvé, *soit* que le pays est seulement abordé, sans déchargement, en cours de voyage à destination d'un belligérant, soit que la marchandise est déchargée—en mains neutres ou belligérantes—dans le but manifeste ou dissimulé d'être transportée plus outre, *par terre ou par mer*, pour arriver à destination d'un belligérant. Et dans ces cas, le délit de contrebande est déjà perpétré par le départ ou le voyage, car la culpabilité consiste dans le but final."

There can be no doubt that the principle of the doctrine is sound and that some eminent modern lawyers, though objecting to it in theory, recognise its value when applied to practice. The real question, as may be inferred from the discussion of the Institut noted above, turns upon the strength of the evidence. Is the presumption in each case of the real destination of the goods sufficiently strong to bring about the condemnation of the cargo? The presumption that the contraband cargo is destined for delivery to the enemy ought to be of the strongest, and, though it can hardly amount in any case to positive proof, should leave no reasonable doubt as to the justice of the sentence. If, on the other hand, the circumstances of the case were doubtful and the cargo open to reasonable suspicion, the captor might exercise what is called his "Right of Pre-emption." This gives him the right to purchase the cargo at a price fixed by himself, which is generally the cost price of the goods in the producing country and ten per cent. in addition as representing a fair profit to the owners. He also pays the freight of the vessel to the port of destination.

A neutral State naturally objects to belligerent interference with its trade; accordingly, while neutral, it looks askance at the theory of continuous voyage. But when that neutral becomes a belligerent the conditions are reversed, and such a State, in the maintenance of its own interests, finds itself constrained to adopt a theory which before it had rejected. Examples of this change of opinion from time to time occur, and we have seen that the United States, Italy, and England are now committed to the doctrine. It may be inferred from this that other nations will follow their example, and that the doctrine, though still unsettled and by no means recognised as a rule of International Law, seems likely to be upheld by every maritime State when it adopts the *rôle* of a belligerent.

WHAT CAN WE LEARN FROM THE BOER WAR?

By General the BARON COLMAR VON DER GOLTZ.

Translated by permission from the "Deutsche Revue" for August, 1902.

THE spectacle of a small race of peasants and herdsmen, whose total numbers fall short of the populations of towns like Munich or Cologne, maintaining a war for nearly three years against the first Power in the world, and compelling that Power to put forth the most extraordinary efforts to bring the war to a successful conclusion, is a matter which calls for earnest consideration, since we have to search carefully through the previous history of the world, in order to find anything at all analogous to it. The struggles of the inhabitants of the Basque Provinces for their rights, of the Vendeans for their King, the Albanian Skanderbegs for their faith, the Druses in the Hauran, and isolated Circassian tribes for their freedom, can alone be compared with the war of desperation waged by the Boers of South Africa.

The nature of the theatre of war explains a good deal, but not everything. It certainly embraced a large area, but still this was not so extensive as to be alone responsible for frustrating for so long a time the operations of a numerous army. The difficulties in the way of keeping up the supply of reinforcements, horses, stores, and ammunition are not to be denied; but the unexampled wealth of England in material resources was of great assistance in overcoming these difficulties. Nor was it a question altogether of roads and railways in a quite God-forsaken desert.

The astonishing skill of the Boers as marksmen is considered by some to have been at the bottom of their extraordinary resistance; but experienced European officers who took part in the war have assured us that on the whole they were no better riflemen than the average well-drilled German soldier. Moreover, a considerable proportion of the Boer force consisted of foreign immigrants from the towns and villages, who by no means possessed the inherited virtues of the old colonists; while the tradition which saw in every South African Boer a hero *sans peur et sans reproche* has long been shattered. It is quite true that the majority of the leaders and soldiers were materially aided by their robust constitutions, the hard method of life to which they were accustomed, and their

sharp eyesight, qualities which were calculated in some measure to balance the deficiencies of the remainder. But all this does not solve the riddle.

It is equally erroneous to put the prolongation of the war down to an abnormal display of incapacity on the part of the English troops. The strategical leading of the campaign was, it is true, open to much criticism. But we must be just, and take into consideration that at the outset events beyond the control of the English generals contributed not a little to upset the pre-arranged plan of operations. Such, for instance, were the locking-up of the English troops in Ladysmith, Kimberley, and Mafeking, and the anxiety to prevent those places falling into the enemy's hands led to the splitting up of the attacking army, until Lord Roberts put an end to this source of mischief, and with united forces made his advance on Bloemfontein, Johannesburg, and Pretoria. Certainly many another general under similar circumstances would have acted as his predecessors in the command did.

With regard to the fighting capacity of the troops, I will confine myself to repeating the answer which I received from one of our officers, who had been present during the war and knew how to use his eyes, when I asked him the question as to the bearing of the English when they advanced to the attack, "Like our own troops during the manœuvres!" was his reply. We shall, therefore, certainly go wrong if we seek for a solution of the problem solely in the mistakes of the English leaders. These undoubtedly had their effect on the course of events, but so also had the Boer characteristic method of fighting; still these effects are limited.

If we look more closely into things, what strikes an observer first of all is, that the extraordinary superiority of the English in artillery proved to be singularly ineffective in the heavier battles. This is of greater interest to us than the phenomena in the infantry fighting, which have more riveted the attention of the military world of Europe. We have recently added considerably to our field artillery, and heavier guns have been attached to our field army, a step which has given general satisfaction. We have thus taken to heart the Napoleonic lessons of the effect of massing artillery, and optimistic gunners look forward to having the lion's share in winning victory in the future. The experience of the Boer war is very much at variance with these views. Over and over again have we seen that a lesser number of Boer guns have successfully held in check the much more numerous English batteries, and that the artillery preparation for the infantry attack, in spite of the numerous batteries employed, has completely failed.

It is reported that, at the Tugela, one single skilfully posted Boer gun put all the guns of one English battery out of action one after the other. This can only be explained by the fact that the effect of modern

guns is much decreased, if they are drawn up too closely together, and that an increase in the number of pieces is absolutely of no effect, unless at the same time they can get a sufficiently extended front. This should give us pause for thought, as it shows us that the massing of guns alone is not everything in an artillery battle. There have been similar lessons to be drawn from military history in the past, only they have been forgotten. At Auerstädt, 244 Prussian guns were unable to hold their own against 44 French.

An eye-witness at Colenso, who had also fought at Beaugency, where the artillery fire was very heavy, relates that at the last-named battle in 1870, it was as nothing when compared with the hellish uproar which prefaced the English attack. The rocky slope, half-way up which lay the Boer position, was speedily covered with an impenetrable cloud of dust, that quickly hid the defenders' from view. So thickly and rapidly fell the storm of projectiles, that the spectators believed the Boers must have withdrawn; when suddenly a heavy rifle fire was poured on the advancing lines of the English skirmishers, which, in a few minutes, brought them to a standstill, the damage caused by the artillery fire having been extremely small. The view, which is so commonly held, that, in the future, it will be possible to drive an enemy out of a good position by artillery fire alone, without the infantry suffering heavy loss as they come under a close fire, will prove a quite erroneous one, where a foe is skilfully handled. "Whether the nerves of our soldiers will prove equal to the strain of the moral effect of such a terrible fire, seems to me certainly doubtful. The Boers, as it is known, have no nerves," continued my soldier friend at the end of his graphic description.

That is indeed the point!

The action of infantry against infantry in the South African war has taught us anew how strong the defence is against a purely frontal attack, and how much a plucky defender, even when holding widely extended positions with small forces, can risk, so long as his flanks are secure. To repeat what we have already said about the artillery: if we crowd our men too closely together, we naturally increase the losses, and arrive at last at a point where the throwing of fresh swarms of men into the firing line contributes less to the efficiency of the attackers, than does the freedom of arm and good cover to the defending force.

In short, it has been proved conclusively how difficult it is to advance over open country without cover, in face of the rain of bullets from modern weapons, no matter how much bravery is displayed by the attacking force. More careful utilisation of natural cover, and a still greater circumspection on the part of the leaders in bringing up their supports, are already receiving an amount of consideration, which is bearing fruit on our training grounds. But all these things are not

absolutely new. The battles of Beaune la Rolande and on the Lisaine have already shown us the strength of a good defence position against a frontal attack; Plevna showed us the difficulty of an advance over country without cover against a well-concealed enemy, who is armed with modern rifles; and it has also been already shown a superiority in artillery is not enough alone to ensure victory, for at Plevna there were 450 Russian guns against 45 Turkish. These old lessons have been brought again to the front and emphasised by the Boer war. New, however, was the extensive use of mounted infantry, whose utility particularly showed itself during the second period of the war. The obstinate resistance of small rapidly-moving detachments against a large, well-organised army, which was overrunning the whole country, and was master of the principal lines of communication, necessitates our closest attention. In European wars opportunities may well occur for the use of such bodies, where it is a question of destroying supplies or raiding the lines of communications. But for use on a large scale, the conditions, at least in Western Europe, are wanting, namely, a vast expanse of uninhabited country to operate in, with good hiding-places for those who know it, and an opponent who does not as a rule move much. At the same time, we must not be understood to be despising the use of such troops, which, rightly handled, can do good service, and in case of a war in the East, lasting some time, could play an important rôle.

So let us admit that European soldiers may draw many useful lessons from the Boer war, and one salutary lesson above all others, viz., that numbers in war are not absolutely decisive, as has been so often asserted in recent times. The *rage de nombres* has had a damper.

But the most important lesson which we can and must learn from the Boers is one which stands quite distinct from the military ones. An ardent, self-conscious love of their country it was, which above all enabled this small people to maintain the war against the much superior Power. Their freedom and independence were threatened, and were as good as lost if they did not seize the sword. Therefore, every man and woman of the living generation rose as one, affording us a splendid example; rose with the full knowledge of what they were undertaking and of what was at stake. The decision to fight was taken without hesitation by the elders who sat in Council, when it was clear that there was no other way out, except their submission. To this resolution the austere and determined men, who contemplated the possibility of their defeat as quietly as they did their victory, adhered. Any race would be fortunate who had such men as their leaders. We know also what strength the Boers derived from their trust in God. It lifted them above the disturbing thoughts, which the great superiority in numbers of the enemy must otherwise have raised in their minds. To the living races of Europe this

unanswerable proof of the practical importance of the high ideals of faith, freedom, and patriotism should be of immense advantage.

Not less apparent is the value of a simple, hard manner of life, which is spent in an almost continuous struggle against difficulties and dangers. Only men educated in such a school could have carried on a hopeless struggle so long and would have continued to obey without a murmur when forbidden by their leaders to sleep under a roof up to the end. Our European cities cannot produce such men. We certainly cannot return to a more primitive state of culture in order to make ourselves more fit to fight, but it is at the same time necessary to counteract the enervating influences of our higher civilisation. During the whole period of the education of our youth this must be done, but more especially during their time of service in the Army. The care which, from praiseworthy motives certainly, is bestowed on the well-being and comfort of our soldiers must have a limit, when we are obliged to admit that the greater number have no experience of hard country life. Above all, must the greatest efforts be made to harden the recruits physically and morally. The man who has complete confidence in himself will stand more than the one who lacks this training. To love danger in war, the soldier must be taught in peace. Never should the fear of responsibility lead to the shirking of necessary exercises because some danger may be incurred by those taking part in them, for war is a serious thing and demands serious training.

Only the general pursuance of such principles will allow us to build up a numerous class of the men whom we shall require in a future war, if we are not to fall short in skilful leaders. We have not been witnessing a short, brilliantly carried out, national war with forces superior in numbers and training, such as our wars in 1866 and 1870, but a life and death struggle against a vastly more powerful foe, which the Boers for more than a year have been maintaining. It teaches us that the right men come to the front sooner or later during the course of a war, like De Wet, Botha, Delarey, Beyers, and others of a genuine old stamp, who stood firm when the hope of victory had long been given up by the majority. They were also the only ones who could have saved the country and its independence, had it been in any way possible. Such steadfastness of purpose as these men possessed will, perhaps, be very urgently necessary for us in a future war. When the winter campaign in 1870-71 began, we were almost as dangerously weary of the war as the enemy was.

In the character of our youth to-day is a fresh trait, which does not permit of the body being sacrificed to study. It is, however, to be deplored that the older men give up physical exercises so early, for these men are only of an age which we are accustomed to consider as a period of life when they should still be in the fullest vigour, both intellectually and

physically. On this point also the Boer war gives us pause to think and learn. Who has not seen the picture, which appeared in all the illustrated papers, "Three Generations in War," representing grandfather, father, and son, standing next each other, rifle on arm? Vigour and freshness, even dashing courage, among men no longer young, are of the highest importance for us Germans, because under our existing system almost all the men who will lead our armies are men who are getting on in years. But we certainly cannot place side by side in the ranks men of sixty and seventy with boys of fifteen. European civilisation uses up our men quicker than the farmers' life in South Africa; still up to the middle of the forties our men ought to be still active and vigorous, as up to this age they are still liable to be called on to serve as soldiers, and officers and generals must display these qualities fifteen years longer.

It will probably be objected that as all the skill of the Boers did not prevent their overthrow, their example can hardly serve as an object-lesson. That is in a measure true and we will not overlook it. Their whole method of fighting was directed to the defensive—and this must always end in defeat. They had no definite aim, although what they ought to have set themselves to do was clearly marked, viz., to drive the English army out of South Africa. Had they kept their eyes steadily fixed on this object, it might have led them to assume the offensive at the proper moment, in the doing of which in the main lies the secret of victory. In spite of everything, however, the Boers have won the respect of the world, even of their enemies, a tradition of the highest value to be handed down to the posterity of their nation, and that is much to have saved from so desperate a position.

We learn more willingly from the Boers than from the English, but it would be very stupid if we did not attempt to realise what the national characteristics are, which, in spite of a succession of defeats, led finally to victory; and among these, standing first, is the great fact that they always pursue a steadfast policy, directed to some positive end, which does not permit them to remain satisfied with the maintenance of the *status quo* when ambition calls. During my years of wandering in the East I have had relations with Englishmen holding important positions, whose energy and strength of purpose I was always constrained to admire. Some twenty years ago, a military officer of high rank, who had served long in India, spoke quite openly to me about India:—"We shall lose India one day, not through Russia, but through the Indians themselves; they are beginning to shake themselves free of tutelage, and a people of 300,000,000 can hardly be forcibly kept down by a few hundred thousands. We shall then need something as an equivalent, and this equivalent we shall find in Africa.

When the Boer war broke out, an English friend wrote to me from the East:—"Africa is necessary to us for our future, and we cannot permit a secret enemy in the rear of our Colonies. If 100,000 men will not suffice to subjugate the Republics, we shall send 200,000, and if they are not enough, then 300,000."

And this has exactly come about, and from it we have something to learn.

The leading statesmen evidently held the same opinion and they seized the right moment for carrying the matter through. The Spanish-American war was wisely used by them, in order to establish good relations with their cousins, which they secured before their own crisis came to a head. The aversion to war of the Great European Powers was evident to them. The Eastern disturbances of the nineties had clearly shown that the Great Powers, even when they are apparently acting together, can yet paralyse mutual action. From Russia, which at any moment could have interposed a decisive veto, nothing was to be feared, owing to the love of peace of her ruler. Such a favourable moment might not occur again in a hundred years, and Chamberlain and his colleagues were not only sharp-sighted enough to recognise this, but they possessed the determination to utilise it, regardless of everything else. The same men remained equally immovable when misfortunes came and the hope of an easily-won victory vanished.

It is to the credit of the English people that, in spite of the glaring defects in the organisation of the Army and its leading, they were not turned from their purpose. Criticisms over the events of the war were open and severe, but there was the fixed determination to repair the blunders and to provide the necessary means, to bring the war, since it had begun, to a successful conclusion, no matter what the cost or what others thought.

This self-confidence, this energetic patriotism or national pride, can —we should be blind to deny it—serve us not less as an object-lesson than the manly and soldierly qualities of the Boers, which we have so highly admired.

In conclusion, I can only point out that the South African war—as it seems to me—teaches us far more than merely new tactical formations and strategical combinations.

THE LOCATION AND METHOD OF TRANSPORTING THE WOUNDED IN WAR.

From an article in the "Archives de Médecine Navale," by Dr. LÉO, Chief Surgeon of the French Navy.

Translated and Abridged by Staff-Surgeon C. MARSH BEADNELL, R.N.

THE present juncture seems opportune for a reconsideration of the question of transporting and housing the wounded in maritime war. Our Navy, lately voted large sums of money by Parliament, is about to be augmented by the addition of vessels of immense tonnage containing spacious and powerfully protected interiors, in which, if only the necessary steps be taken at the time they are under construction, it will be possible to provide armoured locations for the wounded, and roomy shafts and passages leading thither.

Upon our new 15,000-ton battle-ships and 12,000-ton cruisers the space monopolised by such armoured locations will not be stinted, provided both those who control and those who carry out the construction of these ships be thoroughly imbued with the utility and indispensability of such places for harbouring the numerous wounded that must accrue in the wars of the future.

We have divided this article into three sections, as follows :—

1. The present methods of transporting and housing the wounded in naval engagements.
2. The absolute necessity of a regulated ambulance service and of armoured berths with communicating shafts and passages for the use of the wounded in time of war.
3. Proposals for this regulation and plans of the posts and passages.

SECTION I.

1. *Present State of Affairs.*—It may be predicted without the slightest exaggeration that the question of dealing with the wounded in war afloat has not advanced a single step during the last 30 years. Nevertheless, it is certainly not for want of official communications

upon the subject that this deadlock has arisen, but these communications have been devoid of any effective result save that of the provision of certain means of transport, the Ministerial decree of 24th January, 1897, making stretchers of the war pattern—which upon certain vessels *e.g.*, the "Amiral-Baudin" are useful not only for landing parties, but also for the transport of the wounded on board after an engagement afloat—compulsory, and the decree of 8th September, 1897, enforcing as part of the equipment of all battle-ships and cruisers Auffret's *goultières*.[1] Here we may remark that this latter mandate, in limiting the number of Auffret's *goultières* to two for battle-ships and one for cruisers makes unremitting working of the passages excessively difficult, and, as we shall see further on, many ships, the "Amiral-Baudin" in particular, prove that a supply of these excellent means of transport sufficient to ensure the ceaseless replenishment of the passages is of the utmost importance; the actual number should be fixed for each ship by the senior surgeon after due consultation with the commanding officer. We will leave on one side the many decrees upon this subject promulgated prior to the above-mentioned, and confine our attention principally to those pertaining to the actual methods of dealing with the wounded, *e.g.*, that which the Council of Works notified in the despatch of 12th August, 1894, calling the Minister's attention to the importance of framing rules and defining the principles upon which depends the succour of the wounded; also that of 4th July, 1895, advocating that, in consequence of the importance upon all modern vessels of any question relative to the medical service, a senior medical officer of the Navy should in future be appointed to co-operate with those superintending the construction of new ships, and advise upon all questions bearing upon the hygiene, the sick-bay and annexed premises, the various quarters, the heating apparatus, etc., and again the recent decree of 2nd September, 1896, really a sequel to the preceding, having as its chief purport the arrangements to be made on men-of-war for the proper regulation of the ambulance service during battle. We must not omit to mention two decrees that are perhaps the most important of all, those of 13th May, 1890, and 27th May, 1890, enjoining that plans of the posts and passages for the wounded be laid down in the original designs of the ship. On the other hand, we should like to silently pass by the deliberation of the Superior Council of Health of 22nd November, 1898, but can only afford to ignore it for the time being, postponing our criticism of it until the second section of this article, where we will endeavour to prove the urgent necessity of armoured berths for the wounded. It is evident that so many recommendations upon this subject should receive due con-

[1] A kind of hammock cradle.

sideration, no future man-of-war should be without its posts and passages for the wounded; these should, moreover, be definitely laid down in the ship's plans, so that on commissioning, all that remains to be done is to see that they are suitably equipped. Two of the decrees above mentioned (4th July, 1895, and 2nd September, 1896) seem at first sight to fulfil the demands of the most exacting, but directly we examine into the actual results effected, especially the proposed formation of a Commission including a senior naval medical officer, for the purpose of supervising the installations for the wounded in new ships, the least we can say is that they are without benefit to the Service. In fact, the merest perusal of the official reports containing the reports of these Commissions relative to the most recent ships, the "Masséna," "Gaulois," "Charlemagne," and "Iéna" compels one to denounce them as exhibitions of the most deplorable impotence. What we desire is the inclusion in the plans of the as yet unbuilt ship of these shelters, and we repeat that all attempts to insert them in vessels already constructed will be faced by insurmountable difficulties; so long as constructors do not lay down a special place for the wounded in their primary plans—a place that is permanently fixed and incapable of being misappropriated or otherwise interfered with—so long will all attempts at their installation in completed ships remain ineffective, and the only achievement of the Commission appointed by the decrees of 4th July, 1895, and 2nd September, 1896, is a series of useless statements and prodigal promises. To quote some cases in point: the Commission states that on board the "Masséna"—"the space serving as a shelter for the wounded has been much encroached upon and reduced to the slenderest dimensions by the deposit in its very midst of electric winches, ammunition hoists and an oil tank—that the station of the wounded is well-nigh inaccessible, and presents the double disadvantage of containing auxiliary machinery the management of which necessitates the presence of many men, and of being exposed to a high temperature." The Commission concludes with the unique consolation to this grievous state of affairs that the dispositions of the ship do not allow of any other installation.

As regards the "Gaulois," the Commission contents itself with a mere description of the locations avoiding any criticism or suggestions for their improvement; it recommends, nevertheless, the installation of eleven Auffret's *goulttères* (four to be of metal and seven of cane), which it considers the minimum number if the shafts and passages are to be worked satisfactorily. This recommendation is, however, quashed as being irregular. The Commission observes that on board the "Saint-Louis," in spite of the fact that passages for the wounded have been installed, the problem of the rapid removal of wounded from the various batteries, etc., to the place set apart for the wounded is by no means solved; the Commission

also calls attention to the fact that the shelter for the wounded is unprovided with hot water.

The plaints, sterile statements, and platonic promises of these Commissions sufficiently prove their uselessness and impotence, and we need dwell on the fact no longer. What can they do upon such vessels as our most recent ironclads, where the extremely complicated machinery of modern engines has to be accommodated in spaces that are already limited, leaving none available for an installation that has not been previously laid down in the ship's plans, or which, if it has been laid down, has been converted to some other use by the time the Commission sits? Then what is it these Commissions do? They point out numerous defects, and then, owing to their lack of power, reluctantly adopt places for the wounded that are scarcely capable of utilisation. It is, however, a most significant fact that not one of these Commissions has suggested removing the quarters for the wounded out of the protected parts of the ship; not one of them advocates a location in the more elevated and unprotected regions. This constant and tacit adhesion to the principles we extol is a strong point in our favour.

All authors who have written on this subject are unanimous in calling attention to, and at the same time denouncing the present state of affairs.

"These locations for the wounded," says Dr. Gayet, "leave much to be desired; in the greater number of cases they are too cramped, too hot, and much encumbered by machinery. I cannot but express the greatest astonishment, after reading the Ministerial despatches, especially that dated 27th May, 1890, at finding this important question so frivolously dealt with. An order is issued that proper accommodation for the wounded is to be laid down in the vessel's plans, with the result that these selected posts are either subsequently put to quite another use, or else do not fulfil the most elementary conditions of habitation."

"After three years of repeated complaints in the reports of the medical body," says the Director, M. Auffret, "a Ministerial circular dated 24th May, 1890, guarantees the serious consideration of posts for the wounded in the new constructions. . . . The result of this circular, however, falls far short of expectations. . . . It has been urged that the doctors are unable to come to a definite understanding amongst themselves, and frequently offer conflicting suggestions. The doctors will come to an understanding by the time sailors and constructors understand one another. Make the types more uniform and more in accordance with the conditions indicated in the despatches which enjoin that the plans of the location be included in the plans of the ship, and that the location be constructed while the ship is being built,

prevent subsequent interference; then, and not till then, will doctors show absolute unanimity."

"As to a place for the wounded," says Dr. Danguillecourt, "there is no such thing on board the 'Isly,' or rather it exists in name only. It would seem as though this detail had been overlooked in the original plans. There is certainly a place under the large after hatchway and beneath the armoured deck that is called a post of the wounded. But in this situation will be found electric winches, ammunition hoists, and the after dynamo. During battle the men looking after these various appliances completely fill the place, and even the surgeon himself must be a nuisance to all. What could he do in a place where there is not room, I will not say for an operating table, but for a single medicine chest? No; as regards ambulance arrangements, the 'Isly' is no better accommodated than other modern vessels: one post is quite useless. A naval action, it is contended, will be of short duration. Very well; immediately it is over, the whole ship becomes converted into a post of the wounded. Such a statement, however, is but a subterfuge for ignoring all that pertains to the transport of the wounded. Given no post, there can, of course, be no transport. I am unable, however, to look upon this as an improvement."

"Quarters for the wounded," says Chief Surgeon M. Danguy des Déserts, "have not been provided upon any of the ships of the Fleet Reserve since their construction, and many of the recently built vessels are also without it. It is not until the commissioning of the ship, perhaps much later, that the slightest attention is paid to this important question; then the vessel is searched for a suitable site, which is perfunctorily cleared of encumbrances and decorated with the imposing title of *post of the wounded*—a place usually cramped, superheated, and filled with vitiated air where the administration of chloroform would not only be dangerous to the patient, but to the surgeon himself. But this is not all; passages in communication with this post have also to be selected. these passages, originally intended for quite an ulterior purpose, are very complicated and have many defects; consequently, the transport of the wounded is much delayed and they are subjected to veritable torture, their lesions aggravated, and their chances of recovery reduced to a minimum. The particular means of conveyance employed must necessarily depend upon the class of ship, it not being possible to fix a code suitable to every vessel, what is applicable to one being unsuited to another. The Ministerial decree of 27th May, 1890, enjoins the inclusion of a plan of the post in the plans of the ship. When this is done, it will be possible to frame definite, precise, and detailed rules of the *modus operandi* of the ambulance service in war-time. *When everything is well provided for and pre-arranged by a sound regulation*, we may

expect good results of the ambulance service. In the present unhappy state of affairs everything is left to individual initiative."

We are justified, then, in concluding that all surgeons are in accord that the question of the service of the wounded has made no progress since commissioning the most recent ships, and, as M. Danguy des Déserts says, too much is left to the individual. It by no means follows that this system of individual action is always destitute of good results, and the organisation of the posts and passages of the wounded on board the "Amiral-Baudin" is a case in point; but such a system may at any time fail or come to grief owing to insurmountable difficulties. An organised *régime* must be substituted for it. At the present time the only regulations bearing on the subject are Art. 667 of the decree of 6th July, 1891, which says, "During the engagement the senior surgeon and his subordinates are to occupy the stations allotted them by the commanding officer."

Art. 60, decree of 2nd February, 1898 (Service of the Wounded), contains the following instructions:—

1. The P.M.O. will see that the post selected for ambulance and hospital work are made ready for the reception of the wounded.
2. He will see to the proper distribution of the requisite medicines and appliances among the various posts. The remaining drugs, surgical instruments, and various utensils he will cause to be deposited below the protected deck.
3. He will see that the stretchers and other appurtenances of the bearers are in good condition and freely distributed over the ship.

In Art. 83 of this same decree we also find:—

4. An accountant officer is attached to the surgeon for the purpose of directing the stretcher-bearers and superintending the care of the wounded.

Are these instructions sufficiently comprehensive? Certainly not. They do not take into account the *modus operandi* of the medical service; they make no provision for the direction and composition of the *personnel* of the passages; and even granting that the duties of the accountant officer, vaguely defined as they are, would not lead to friction, we are unable to distinguish, in this somewhat ambiguous regulation, who is to give orders and who is to obey them, who to organise, and when and how he should.

In conclusion, we must state that at present the installations for the wounded are found wanting; the regulations upon the subject are insufficient.

SECTION II.

2. *The Indispensability of an Organised Ambulance Service and of Special Armoured Retreats, with Passages, for the Use of the Wounded in War.*—Is an armoured post, capable of sheltering many wounded, in communication with passages absolutely necessary? If the justice of this proposition were but universally recognised as unquestionable, it would be immediately complied with on as lavish a scale as requirements meted, for, as Director Auffret has said, "it should be thoroughly understood that it is not a question of philanthropy that is at stake. All agree on this point. But what have we actually gained at the hands of the authorities in the last twenty-five years? The constructors are probably as much imbued with the sense of philanthropy as are those who command the construction, but both refuse to do anything until they are thoroughly convinced that their action will not in any way interfere with the fighting capacities of the ship. When this is done the difficulty will be solved, surgeons and constructors having but one end in view."

We have no desire to misrepresent facts, and, therefore acknowledge that the indispensability of a post of the wounded below the armoured deck is not universally admitted. Of late years there has been a tendency, which is shown even in certain of the official reports, to discountenance the system of detrusion. We cannot avoid thinking, however, that this is but an attempt to shelve this important question, a question we would fain see settled. Moreover, we are of opinion that a system which is being practised, as well as circumstances permit, upon all French men-of-war, a system that has been much thought and written about by all sea-faring doctors, ought not to be condemned wholesale as it was by the Superior Council of Health of 22nd November, 1898. If we merely picture to ourselves a modern deck of battle; or better, if we consider the circumstances that actually occurred after the preliminary engagements in the later naval actions; we can no longer doubt the indispensability of a well-sheltered post of the wounded as far removed as possible from the combatants. The battle once over, or in the event of the fate of the opposing parties being decided in a few seconds, a definite sheltered retreat for the wounded would be superfluous, for in such a case the whole ship would be a hospital and every survivor a minister to the wounded. But most persons are agreed that a naval action will be of long duration, and that there will be many and repeated editions of it; if, upon our modern ships the light guns' crews of the bridge-decks are going to hamper these regions with their several wounded, while those of the medium and heavy guns render the manœuvring of the turret guns impossible; if upon our older ships the quarter—upper gun—and orlop decks are to be converted

into veritable charnel houses, how will it be possible to carry on the engagement effectively? Further, we must recollect that in all probability it will be necessary to re-open the engagement several times before definitely placing one of the enemy's ships out of action. All chances of success in these fresh encounters will be reduced to a minimum if, during the momentary remissions, the deck of battle has not been disencumbered of all *impedimenta* in the shape of helpless men. *A most important factor, hitherto insufficiently noticed, is the inevitable moral effect, the continuous pacifying influence upon the minds of the combatants of the knowledge that once wounded they may rest confident of help and shelter.*[1]

The exercise of "general quarters" will have already enabled the men to frame a shrewd estimate of the intrinsic merits of this help and shelter; if delusive, so much the more discouraging will be their effect; if trustworthy, the courage and coolness of those who may be spared from having to benefit by their efficacy will be augmented, and, far from having any deleterious influence, will act as a powerful moral influence towards the happy issue of the strife. We shall proceed to subject the arguments of those who condemn the system of detrusion of the wounded into the lower regions of the ship to a candid criticism, first dealing with official and later with the private documents of the various authors. In the proceedings of the Superior Council of Health, 22nd November, 1898, we read:—"Although in our Service the *passage of the wounded*, that is to say, *their transport throughout the lower parts of the ship*, appears to be the dominant ambition of naval surgeons, the Italians, who, by the way, have long and conscientiously studied this question, have decided that there can be no transport of the wounded during battle, the only procedure possible being to get them out of the way of the combatants and dress them on the spot."

We protest against having the Italian Navy, which, like our own, has not figured in any naval engagement in recent years, held up to us as an example for imitation; their investigations upon this subject are neither more numerous nor more conscientious than our own, and it is scant courtesy to sacrifice the aims and ambitions of French surgeons to the opinions of those of other nations; but, acknowledging that some lessons may be learnt from the errors of others, let us see if the Italians really have absolutely abolished all idea of a system of protected posts and passages for the use of the wounded in war.

An article by Dr. Fillippo Rho, a surgeon in the Italian Navy, in the *Rivista Marittima*, May, 1898, entitled "*I moderni criteri sul servizio sanitario nei combattimenti navale*," has thoroughly convinced us that posts and passages for the wounded in the Italian men-of-war are still in use.

[1] The italics are mine.—TRANSLATOR.

Dr. Rho's article being much too long for reproduction, we shall have to content ourselves with some extracts pertinent to the question of the transport of the wounded :—

"*Dressing Stations and Passages for the use of the Wounded.*[1]—As modern vessels of war are divided up into more or less isolated and independent compartments, the medical service in time of war should fall in with the general principle; to the independency of the various compartments should correspond independency of medical aid.

1. The senior surgeon should occupy the most central post of the wounded, and there should be as many posts in the ship as there are medical officers.
2. There should be sufficient room in each post for the accommodation of medical appliances, and for unrestricted movement on the part of the *personnel*, to wit, one surgeon, two male nurses, and two or three attendants.
3. To each post of the wounded should be annexed a chamber (officers' quarters, dynamo-room, tiller flat, magazine, etc.[2]) for the temporary reception upon mattresses of the wounded, either dressed or undressed.
4. The dressing stations should be in direct communication with passages for the wounded,[3] distinct from those for ammunition; each of these should be manned by four qualified stretcher bearers and a few auxiliary brancardiers.
5. All posts and passages should be adapted to the particular class of vessel in which they are to be installed, and should be so chosen that they are well ventilated, well lighted, and, *if possible, well protected by armour.*[4]
6. It is to be hoped that plans of these posts and passages may be included in the primary plans of the ship; in the meantime all we can do in the ships making up our present strength is to study their internal dispositions. The medical officer and the commander should draw up a scheme to be

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[1] So there are passages for the wounded: how then does the Superior Council of Health account for its statement that "there can be no transport of the wounded during battle"? If the statement rests exclusively on the words "during battle," we concur, for, as we have said above, the passages should be worked not during the "heat of battle" but during the "lulls."

[2] Dynamo rooms and magazines are invariably below; the Italians, therefore, like ourselves, advocate the detrusion of the wounded into the lower parts.

[3] A clear proof that they employ these passages.

[4] We ask nothing more than this.

examined, and, if necessary, subsequently modified by a Commission composed of the P.M.O. of the Fleet and some other medical officers and the *chef d'état-major général.* The arrangements, when approved, should be copied into the watch and station bills of the ship on commissioning, so that during general quarters the dispositions may always remain the same, and every hand may have his office clearly defined."

The Function of the Medical Service during War.—

1. At the call "action," all the medical *personnel* repair to their assigned stations—the stretcher parties to the various passages, the surgeons and stewards to their respective stations.
2. Pending actual fighting, the wounded able to walk will, subject to the consent of their executive officer, go to the nearest dressing station; those more seriously hurt will, as opportunity offers, be removed to places of relative shelter, where they will not be a source of embarrassment to the combatants.[1]
3. Directly there is a temporary cessation of hostilities, the captain causes the bugle call for medical assistance to be sounded, the surgeons, sick-berth stewards and stretcher-bearers come up from below and attend to the wounded whom they will find lying down in various parts of the deck, after which they will remove them to the post below, where more elaborate attentions can be given them.
4. Having supervised the detrusion of the first batch of wounded, the surgeons are now to re-occupy the posts and confine their attentions solely to these cases.
5. *Pending the Actual Fighting* the surgeons should concentrate their efforts to saving those in a critical state and stanching serious hæmorrhages.
6. The removal of the wounded to the sick-bay or other site chosen for the ship's hospital, and all major operations should be deferred until the close of battle."

[1] Probably these (2, 5, and 6) are the articles which have led the Superior Council of Health to believe that "the only procedure possible is to get them out of the way of the combatants, and dress them on the spot." But the Italians, like ourselves, make a very clear distinction between what can be done *during the engagement*, and *what after*. We both advocate non-interference when the conflict is in full swing and active intervention at each pause.

Surely, these are not the words of a surgeon who disapproves of posts and passages in the lower parts of the ship? Especially do arts. 4 and 5 negative such a surmise.

Continuing our criticism of the edicts of the Superior Council of Health, we find the following:—"An American naval surgeon, Dr. Gravatt, gives an excellent account, from a medical point of view, of the battle of Yalu in the Chino-Japanese war. Dr. Gravatt was *médecin-major* of the 'Charlestown,' and had, as a member of the Japanese staff, abundant facilities for studying the principles adopted by their surgeons in the deck transport of the wounded during battle. The Japanese Navy is furnished with a most ingenious apparatus of transport, capable of being used either as a bed or as a sofa, according as the three separate segments of which it is composed are inclined; up to the time of the war it was the only apparatus employed during the evolution of general quarters." But listen to the words of Dr. Gravatt:—"Although, at general quarters during peace-time, it was the invariable custom with the Japanese to detrude their imaginary wounded below the water-line by means of this particular apparatus, they found it preferable, in actual war, to remove their wounded comrades upon their backs."

The carrying of our wounded pick-a-back fashion is another means of transport held up for edification! Is the French Navy really reduced to the necessity of taking lessons from the Japanese? As surgeon to the naval division in the Far East, we have had intimate acquaintance with the Japanese Navy, and give it its full due; we have already pointed out that they continued to install armoured posts and passages for the wounded in their ships after the Chino-Japanese war was over; their apparatus of transport is, after all, but a modified Miller's *chaise* as used in the Russian Navy; we can not better reply to the words that the Superior Council of Health have quoted from Dr. Gravatt's report than by a counter-quotation from the "Succour of the Wounded in War Afloat," written in 1896, by the Director, M. Auffret. This work was written two years prior to the deliberations of the Superior Council of Health:—

"The Japanese appear to me to have acted with considerable discretion. Foreseeing the inevitableness of war, they furnished their Fleet with every possible requisite by a judicious selection from the latest improvements of the English, French, and Russian Navies. We know only too well what they have taken from us. From the Russians they have copied Miller's *chaise*, at that time the most scientific and commodious means of transport extant.[1] It is possible that a few

[1] Miller's *chaise* was in vogue before Auffret's *gouttière*, which the Japanese with their so penetrating acumen, would certainly have borrowed of us, had they known of its existence.

of these not being in boom-proof shelters, were destroyed during the battle, but this does not in the least prove that they were wrong to employ them. Dr. Delisle informs us that they were made use of at the battle of Yalu, and were found to answer every requirement. These *chaises*, of which they possessed several models for the several classes of ships, could be lowered through hatchways. We should not, therefore, conclude, as does the surgeon who provides us with these details, that this special means of transport is not in favour and not recommended by the Russians and Japanese, when as a matter of fact it is still provided by regulation on board all their war-ships."

Dr. Gravatt's allegations consequently need not be regarded as of much, if any, importance, and we shall still continue to prefer the employment of Auffret's useful means of transport to any "pick-a-back" system. If the Japanese surgeons really did countenance such a primitive and barbaric procedure, it could only have been because they knew their sailors were less sensitive and more capable of enduring torture than our own, and because a certain amount of confusion, more or less excusable in so newly-fledged a Navy, prevented the employment of the means of transport used in peace-time.

Still referring to the Japanese, Dr. Gravatt (as quoted by the Superior Council of Health) says: — "The ward-room was converted into a dressing-room and operating theatre, in spite of the fact that at general quarters in peace-time, the customary procedure was to detrude the fictitious wounded into the *submerged parts of the ship*."

And what, we ask, was the consequence of this policy, which the Superior Council of Health advises us to emulate? A projectile weighing 305 lbs. penetrated and exploded in the ward-room of the "Hiyei," where the wounded were at the time being attended to by the medical staff; fourteen men were killed outright, including the captain, previously wounded, two surgeons and all the dressers and stretcher-bearers; in addition, twenty-seven other men were wounded. This is a sad, but glaring catastrophe, which we beg to submit as food for reflection to all those apologists for posts of the wounded in non-protected localities. This is the only object-lesson we are able to cull from the Japanese at the battle of Yalu.

The Superior Council of Health, still in the same strain of extolling foreign methods as copy-matter for the French, continues:—"Lastly, consider the ways of the English; the wounded person is laid upon a rectangular cloth, the extremities of which are folded back around his body and firmly secured by straps. For ordinary transport along the decks two long poles are passed through lateral gutters in the cloth; for vertical transport a hook is fixed to the head piece, which is then raised by means of tackle: the apparatus now resembles a horn

or truncated cone base uppermost, owing to the cloth firmly embracing and adapting itself to the general contour of the body. The wounded man is then lowered vertically feet first."

We do not exactly grasp the special advantages of this horn or truncated cone which, a few lines further on, the Council recognises as our Guezennec's hammock, and we see no occasion to borrow our own inventions from other people, especially as we possess a means of transport provided by regulation—Auffret's *gouttière*, which in the words of the Superior Council *is incontestably the best apparatus, not only for transport, but even for the subsequent treatment of certain kinds of cases.* The Council of Health claims that in Auffret's *gouttière* it is possible to treat spinal lesions, but, as we shall see further on, this apparatus is not at all suitable for the treatment of grave lesions of the vertebral column ; we acknowledge, however, that it is the best and safest means of transport, both vertical and horizontal, for all sorts and conditions of wounds on board ship. Soon after the edicts issued by the Superior Council of Health in November, 1898, there appeared in the *Revue Maritime* for April, 1900, an article by Lieutenant Loïc Petit on the battle of Santiago, in which an attempt is made to prove that the system of moving wounded below is not only useless but dangerous. We reproduce *in extenso* those portions of his article that are cognate to the subject in hand :—"The sick bay during battle! What a piteous scene and what chaos! 'When, in the arms of the stretcher-bearers, I was borne thither,' says Captain Concas y Palua, 'I had to exert all my authority to maintain silence, which the gallant ensign, D. Ramon Rodriguez Navaro, in vain attempted to enforce!' The wounded in all the Spanish ships refused to go below to the 'battle-hospital,' the difficult escape from which made them dread the horrible death in store for them should a general disaster overtake the ship. On board the 'Viscaya,' the wounded were placed in a casemate. In the 'Oquenda' they were placed below, where the dying were choked with smoke. In the 'Maria Teresa,' they were deposited in a dark corner forward, beneath the protected deck, huddled together in the midst of pumps and ammunition hoists, where, after a time, nothing but corpses remained. The 'battle-hospital' should be provided with a wide and easily accessible hatchway and a large gangway ladder allowing of easy ascent and descent, especially the former, the wretched victims infinitely preferring to run the risk of receiving extra wounds to the chance of being dragged alive to the bottom of the ocean. On board the 'Cristobal-Colon' the 'battle-hospital' was wisely placed in the engine-room workshops; it should be thus in all ships. There, is, however, a place, not mentioned by the Spanish captain, well suited for a post of wounded—the officers' ward-room and captain's quarters. I believe, as a matter of practice,

it is there the wounded are taken. A good many of our vessels have their post of the wounded situated below, underneath the armoured deck; access to it is difficult, air is deficient and light uncertain—at least the electric light may be cut off at any moment. It is probable that our wounded, like the Spanish, will refuse, unless too weak, to go down to such a lugubrious vault—doubly funereal to their eyes—preferring the fresh air and daylight. It is reasonable, also, to suppose that the surgeon will only be able to effect the simplest dressings, and will not attempt to scramble through hatchways and thread his way along obscure winding passages littered with the cots of the wounded. Surely, then, the simplest plan is to make use of the ward room, where the arrival of the wounded may be anticipated by a due provision of cots and hammocks. Here the wounded will be much better off, and no more exposed than if they were below; moreover, their removal from the ship, if needful, would be much facilitated, and they would run no risk of being imprisoned in a water-tight compartment when the doors are suddenly closed. I venture to offer one other suggestion: it is to place the ship's steward's room above the armoured deck, and convert it in war-time into a post of the wounded. The steward's room is spacious and only used for the issue of provisions, it is invariably situated below the protected deck in close proximity to the store-room, but this is not really essential; space below armoured deck is scarce; why not place the ship's steward's room above this deck? The daily issue of provisions might be somewhat impeded certainly, but in time of war we should reap the double advantage of increased room below, and of a practical and definite post of the wounded above. Upon some ships a system is practised that might well be made more general: that of providing dressing stations in several parts of the vessel, and in close proximity to the batteries, etc."

We have kept our word to omit none of the author's propositions. The Spanish work, "*La Escuadra del Almirante Cervera*" in the *Revista General de Marina*, is to him but a pretext for thrusting out suggestions concerning the particular installations deemed by him to be the most suited to the French Navy. It would have been better had he confined himself to a strict narration of events as they actually survened at the battle of Santiago, we should not then have had the labour of extricating the real incidents from their tangle with the conjectures and opinions of the commentator. However, we acknowledge that his conclusions are based on facts, but they took place under such abnormal conditions that any inferences drawn could not possibly be applied to our battle-ships and armoured cruisers.

The unfortunate Spanish cruisers, owing to indiscreet orders issued contrary to the advice of their admiral, retired, or, to be more correct,

were chased out of Santiago harbour. Destitute of coal of good quality; unprovided with trained stokers and mechanics, they found themselves at the very outset deprived of their sole advantage—speed—reduced by the bad state of their engines and boilers from 20 knots to 12 knots. They thus became so many floating targets or derelicts, which sank under the heavy fire of the American battle-ships that literally riddled them with projectiles, the Spaniards not replying with a single shot.

To conclude from such an engagement that post and passages of the wounded are useless is as gross a breach of reasoning as to infer that gun-sights are unnecessary because those of the Spanish artillery were found giving an elevation for 4,000 metres instead of 2,000 metres, or that torpedoes should be abolished because these wretched fugitives did not employ them. The wounded Spaniards were no better off, indeed they were probably in worse circumstances in a ward-room in flames or in batteries whose decks were on fire, than they would have been below in a hospital filled with smoke and devoid of light, a hospital, moreover, not in the least comparable to that we should like to see installed.

The propositions of Lieutenant Loïc Petit are based on unsound *data* and open to the same objections already raised to the suggestions, somewhat more plausible, of the Superior Council of Health; moreover, these suggestions fail to carry with them the spirit of a profound conviction on the part of their propounder, for a few lines further on he recommends as a suitable place for the "battle-hospital" "the ward-room and captain's quarters," reproaching the Spanish captain for allowing such desirable places to escape his observation. "And, I believe," he adds, "that as a matter of practice it is there the wounded are conveyed"; again, as a last piece of advice, he adds, "Place the ship's steward's room above the armoured deck and convert it in war-time into a post of the wounded."

As a reply to the somewhat fantastic proposals of Lieutenant Loïc Petit, we will turn to a scientific author and see what one of the latest authorities on this question says:—

"An efficient and thoroughly protected post of the wounded is imperative," says Dr. Gayet in his article on the Marine Medical Service in War (1899)[1]:—"Of late years there has been a tendency on the part of a few surgeons to abrogate the use of the lower parts of a ship, where space is limited, access difficult, air too hot and encumbrances numerous, as a site for the post of the wounded and to return to the upper regions and there endeavour to find, either in the normal sick-bay, the ward-

[1] Published in the *Revue Maritime* (February–March, 1899).

room and other quarters, or in the dead-works, spacious localities in which the medical officers may minister to the wounded with greater facilities. But such a system is inadmissible. A medical aid station, consisting as it does of an assemblage of wounded men, cannot be situated in the most vulnerable portions of a ship. Does not the captain, with the object of minimising the terrible effects of large explosive projectiles, make his men cover as much deck and take advantage of as much shelter as possible?

"During the battle, lasting many hours and sub-divided into many minor engagements, there will be a certain number of respites of sufficient duration to allow of the removal of the wounded to a sheltered dressing station. It is no good depositing them anywhere; if their sufferings are to be assuaged and the demoralisation begotten of their witnessed agonies is to be suppressed, we must seclude them in a place of shelter and not subject them to fresh injuries when they come asking aid."

We have quoted the words of our colleague because they form the embodiment of our own views; we need scarcely add that neither of Lieutenant Loïc's Petit's suggestions appears to be acceptable, the circumstances as they occurred at the battle of Santiago not justifying such conclusions. It is scarcely fair to quote any of the Hispano-American engagements as examples; at Cavite the obsolete wooden vessels of the Spaniards were at once overpowered by the modern well-equipped American ships, and at Santiago the unprotected Spanish cruisers had not sufficient speed to escape the American battle-ships which mercilessly bore down on them, placing them *hors de combat* without any resistance. On the other hand, we have not forgotten a certain incident that took place at 7.30 a.m. on the flag-ship "Reina-Cristina," when a shell from one of the American battle-ships exploded in the ward-room, converted at the time into a sick-bay, killing every person in it; coupling with this the similar slaughter in the ward-room of the "Hiyei," we may justly conclude that neither the Hispano-American war nor the Chino-Japanese has furnished any proof of the inutility, still less of the danger, of armoured posts of the wounded in the lower parts of the ship.

There is perhaps one plan, if it were only practicable, that would allow of the abolition of posts of the wounded below. It was advocated by Director Auffret in his work of 1894, in which he proposed to erect a post of the wounded in the upper parts of the ship where air and light are not at a discount, *on condition that this post be protected by armour*, on the same principle as the captain's conning-tower or casemates of the 164·7-millimetre (6·48-inch) guns in the "Amiral-Baudin." This proposal, which unhappily does not appear capable of realisation, "was

put forth," says Director Auffret, "by those who could not enter the posts of the wounded in certain of our battle-ships without experiencing qualms of conscience. . . . This wish to erect posts of the wounded in the upper parts of the ship instead of below, should not evoke astonishment if we but recollect how stuffy and out of the way these localities usually are, and what difficulties have first to be surmounted before anyone can be conveyed to them—difficulties so great that we have heard naval men, well qualified to judge, express the opinion that in actual warfare the attempt would never be made. Then why construct such places?[1] Surely they are not for the purpose of acting as a sop to the public.[2] If posts for the wounded and passages in communication with them cannot possibly be constructed below we shall have to resort to a site amongst the dead-works of the ship."

Our only rejoinder to this chimerical suggestion, is that both posts and passages *can* be constructed. A careful inspection of our most recent battle-ship, *e.g.*, the "Saint-Louis" enables us to state that the ventilating shafts terminating just below the protected deck afford excellent means of transit for the wounded, and that the many spacious and well-armoured localities would serve well as hospitals of combat, the only drawback is that the posts and the passages do not communicate. When inter-communication is established, a not easy matter, the problem will be completely solved. And we are convinced that this solution presents far fewer difficulties than that of installing a sufficiently fortified post in the dead-works above. Simultaneously with the drawing up of this report, there appeared in the *Archives de Médecine Navale*, Vol. LXXIII., No. 5, May, 1900, an article by Dr. Jourdan, physician of the first class, entitled "The Medical Service in War," composed of extracts from his medical report of 1899, when he was *médecin major* of the torpedo-boat destroyer "Fleurus" in the Northern Squadron. This article is a fresh proof of the vital interest still displayed by all naval surgeons in this question—a question which, in our opinion, should take precedence of all others.

Dr. Jourdan agrees with us in claiming that "the organisation of the medical service should be regulated in a uniform manner, and not, as the custom now is, be left to the pleasure of the surgeon and captain. . . . . It would be an excellent thing for the organisation of this branch of the Service if definite and uniform rules were laid down for all ships."

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[1] Unfortunately, and this is of what we complain, *these places are not expressly constructed;* any place is chosen. If only they were specially designed, and made as posts of the wounded, we should not be having ovens and other uninhabitable regions.

[2] Yes; many of the present-day posts of the wounded are merely installed as a matter of routine, and to satisfy public opinion.

Like us, too, the author takes as a working standard his own ship, and at the end of his report draws up even a more detailed plan than our own of the *modus operandi* of the medical service in war. We are pleased at finding so eminent an authority contributing to our views; on one point only do we seem to diverge—that of the site of the post of the wounded.

"It is probable," says he, "that in future we shall abandon the idea of lowering the wounded to 'below,' where neither space nor air is plentiful. I admit the cruelty of subjecting men already wounded to the reception of additional injuries at the hands of the enemy, but our posts of the wounded below present so many disadvantages to the many, against their sole advantage to the few, that they do not further the general welfare. I maintain that the best post is that which is the most commodious, most freely ventilated, and most accessible."

In the first place, we note Dr. Jourdan is in the "Fleurus," where, as he himself admits, it would be futile to dream of erecting a post of the wounded beneath the protected deck, the only space here available being a few square metres in the general magazine; store-rooms, stokeholds, and engines occupying the remainder.

Even we, who are such staunch advocates of lowering the wounded into submerged parts, would not think of such an operation on a small craft like the "Fleurus." Our remarks apply solely to battle-ships and large armoured cruisers.

Secondly, Dr. Jourdan presupposes all posts of the wounded to be cramped, inaccessible, and unventilated; but the most bigoted upholder of these posts would be the last to desire to see their adoption if they really were uninhabitable, and, consequently, unusable. We feel certain, however, our colleague would accept a post of the wounded if, like that in the "Amiral-Baudin," it was well ventilated, easily accessible, afforded the wounded good shelter, and was large enough to permit of surgical operations being conducted within it. We feel confident, moreever, that he will welcome the posts of the wounded that we are relying upon our constructors to provide in the forthcoming naval programme. The proof that, even in this matter, Dr. Jourdan's views are not so very removed from our own, lies in the fact that he places the surgeon's station below the protected deck as much under shelter as possible. Here are his words:—

"*The Surgeon's Post During Battle.*—It is admitted on all sides that the surgeon, if there be but one, must not expose himself during the battle, for if he becomes wounded or killed the wounded are deprived of his services. In the 'Fleurus,' the general magazine below the protected deck is the only sheltered space. The doctor will repair thither at the commencement of the engagement, and since at least one

trained assistant is requisite for all major dressings, he will take with him his sick-berth steward, the latter being of much more use after than during an engagement. The surgeon's post of combat will prove of further use in sheltering much of the medical *matériel*, which, being in close proximity to the post of the wounded above, could be quickly raised or lowered by tackle."

From the detrusion of medical *matériel* to the detrusion of wounded *personnel* into a place of shelter is but a step; we do not hesitate to affirm that had Dr. Jourdan's general magazine been more comprehensive he would have taken this step. It is not so much a question of principle as of opportuneness. But, putting aside this debatable point, we acknowledge the thoroughness with which the author has drawn up his scheme of routine for the medical service during war, and congratulate ourselves at being so much in accord with a work which last year received honourable mention in the prizes of naval medicine. We have the further good fortune to find ourselves in complete unison with *M. le médecin en chef*, Danguy des Déserts; his dissertation, of exceptional value in that it comprises arguments both for and against the detrusion of the wounded into the lower parts of the ship, entirely upholds our views. We reproduce some extracts:—

"Are bomb-proof chambers, specially designed as posts of combat for the wounded, necessary upon our modern vessels? This, perhaps, appears a strange question. I pose it, however, because a certain number of captains and naval surgeons have opined that dressing stations, as they exist to-day, must be done away with; in future, all men wounded in action being taken to the normal sick-bay, ward-room, or captain's compartments, as the case may be, for treatment. They unwarrantedly assume that transport below involves an inordinate extension of time and much suffering of the wounded, that surgical operations are necessarily excluded, and the employment of chloroform dangerous. On the other hand, they claim that their locations will be cool, airy, and well adapted for operations; in short, that transport will be possible *throughout the whole engagement*, thus ensuring the speedy amelioration of the wounded. I cannot accept this view; those who believe that dressings, still less operations, can be carried on in such places live in a fool's paradise. Anyone who has witnessed firing practice with small and medium guns must be convinced that all non-protected parts of a ship will be speedily destroyed and rendered uninhabitable; if posts of wounded are installed in such places the medical and surgical appliances will be scattered and ruined, the wounded rewounded, and the nurses, stretcher-bearers, and even the surgeons themselves, injured or killed at the commencement of the engagement—assuredly the best method of depriving the wounded of their every chance of assistance; the battle of Yalu has furnished

excellent proof of this. I maintain that the 'battle-hospital,' if it is to be of any use, must be located in a part of the ship that is proof against projectiles; where the surgeons, with their *personnel* and *matériel*, may be safely lodged until a respite allows of their tending to the wounded . . ."

With these so convincing utterances, we will terminate our endeavour to prove the indispensability of armoured posts of the wounded; and, contemplating the future rather than the present, having in view especially the belligerent units in the naval programme of 1907, *we declare most emphatically, by our experience of recent naval actions, and by our perfect harmony with the opinions of the majority of naval surgeons of all Navies, that it is the urgent duty of the constructors of our new fleet to provide upon the magnificent vessels of which it will be composed, well-ventilated, well-lighted and well-protected posts of the wounded, in communication with the upper deck by means of straight passages, allowing of a free to-and-fro excursion of the apparatus of transport and the rapid evacuation of the wounded from the upper decks.*[1]

Section III.

Scheme for the Installation and Organisation of Posts and Facilities for Transport of the Wounded.—Hoping we have proved the necessity of armoured shelters for the wounded, and passages in communication with them, we propose now to introduce the last part of our problem. What description of posts and passages is necessary?

1. *Posts of the Wounded.*—If special places for the wounded are to exist at all, they must be serviceable. As a Minister of the Tribune of the Chamber has said, expenditure need not deter us; the lives of our sailors are not to be weighed against a few thousand francs. These premises admitted, let us enquire into the details. Should the posts of the wounded be single or multiple? Here divergences of opinion at once arise; on the one hand, are those who advocate a single post, because it focuses medical assistance to one point of the ship, thus eliminating errors and confusion in the transport of the wounded pouring in from all parts—because a smaller *personnel* and less abundant, and consequently, less costly, *matériel* is called for—because it is easier for the constructors to instal a single post that shall embrace all the perfections asked for; on the other hand, are those who urge that double or even triple posts are preferable as being less liable to bring about a block in the transport, and as allowing of the sub-division and distribution of the wounded according to the particular severity of their hurts, slight cases being dealt with in a subordinate post, and grave cases

[1] The italics are mine.—Translator.

in the principal post. We advise a single and central post, not deeming the *personnel* sufficiently numerous to supply more than one, and not at present wishing to press for an augmentation of this *personnel*. The best plan, undoubtedly, is to leave this question of unity or multiplicity of posts to the discretion of the constructors, who will be able to take into consideration the internal dispositions of the particular vessel they have to deal with. First and foremost the post must contain respirable air, be well-lighted, cool and not oppressive, of sufficient magnitude to permit of unfettered movement; in a word, must be such that a wounded man will be able to exist inside it. Indissolubly linked with these conditions is a free and easy means of access to the post by passages; these passages, of which we shall speak later, will act not only as viaducts for the wounded, but also as conductors of vivifying air both to them and to those ministering to them. Electricity will furnish the light by means of many fixed lamps and wandering leads; the temperature must not exceed 40° C. when the engines are working; the question of cubic capacity and surface area we must again leave to the discretion of the constructors, reminding them meanwhile that a tenth part, some authors say a fifth part, of the ship's strength is liable to be laid low by the enemy's guns. We hesitate to go so far as Dr. Gayet, who asks for three rooms annexed to each of the main posts of the wounded: one for the reception of those requiring attention, one for doing the dressings in, and a third for the disposal of those who have been dressed. The same authority states that the total area of these rooms should correspond to one-eighth part of the effective space. In the "Amiral-Baudin" we have increased the available space by suspending cots from the roof, in which many wounded over and above those lying on the mattresses may be accommodated. The various bulkheads and partitions in the submerged parts of a ship forbid any considerable space, however desirable, being devoted to the sick-berth, but they allow, by means of lateral or median doors, of the removal of wounded into neighbouring compartments. In summing up, we ask before all else, that the Ministerial decree of 27th May, 1900, completing the deliberation of the Council of Works, in its session of 30th May, 1890, and pointing out that it is when the ships are under construction that posts and passages should be installed, be put into vigorous execution. "*The post of the wounded*," says the Council of Works, "*should be bomb-proof, have plenty of air, be well lighted and as close as possible to the hatchways through which the wounded are lowered.*"

2. *Transport of the Wounded.*—As regards this particular operation we shall be brief, inasmuch as the means of transport are provided for by regulation—the Ministerial decree of 24th January, 1897, ordering the cots of war, and that of 8th September, 1897, Auffret's *gouttières*—and the installation of the passages rests with the constructors, of whom we simply

ask that they may be made to terminate in the central post. We would urge, further, that a double communication, like that in the "Amiral-Baudin," between the post of the wounded and the deck above the armoured deck may be installed, so that Auffret's *gouttière* once emptied, may be returned through a different orifice from that through which it descended; this plan, however, would not be necessary if the passage terminating in the post of the wounded were sufficiently large to allow of a double means of transport—either Auffret's *gouttières* or the electric cots. We have one further request to make—not this time of the constructors, but of the comptrollers. It is that each battle-ship and large armoured cruiser may have a sufficient number of Auffret's *gouttières*; this number not to be fixed alike for all ships, but to vary according to the particular dispositions and internal economy of each unit of combat. We will conclude this section with a description of the posts and passages as they exist in the "Amiral-Baudin," not because we consider our system represents the ideal, the "Amiral-Baudin" being already an old and obsolete type of vessel, but because it is a system that has been in operation some time, a system, moreover, we believe to be in vogue in the majority of ships.

The posts and passages of the wounded we are about to describe minus their faults and plus their good points, are those we consider the best adapted to the Service. It is instructive to observe the history of the various posts of combat, for there have been many on the "Amiral-Baudin" and other ships, as it well illustrates how everything in this branch of the Service is allowed to slide, and how important it is to have definite regulations on the subject. In the "Courbet" there have been three successive phases of installations; first a post was installed in the central well of the ship, the four corners corresponding to the four ammunition hoists; it was impossible to stand upright in it; the temperature oscillated between 53°C. and 60°C.; one's feet clad in thick boots were burnt by the deck, which immediately superposed the boilers. This first post was subsequently condemned as uninhabitable, and a search was made for another site. None being found suitable, it was decided that no post could be installed. By the captain's orders this fact was noted in the report of the general medical inspection of 1897. Thus ended the second stage. Finally, a succeeding captain, disapproving of so important a fighting unit being without a post of the wounded, issued orders that one must be found. A site was soon chosen, and a post installed, which on the whole constituted an excellent shelter, and was in easy communication with the upper decks. This was the third and last stage.

Is not the above clear proof of the absolute necessity of having these posts definitely and permanently installed in each ship, especially a ship like the "Courbet," which at no distant date was a most important

unit of combat, and installed in such a manner that any subsequent intermeddling is prevented? The "Amiral-Baudin" has passed through similar stages. We will describe the last only.

The original arrangements being found absolutely unsuitable, the captain nominated a Commission of officers to determine on the best place for the accommodation of the wounded. The report of the Commission made 30th April, 1898, is as follows:—

The Commission distinguishes two categories of wounded:—

1. The slight cases, capable of resuming their duties after the application of a simple dressing.
2. The urgent cases, requiring immediate dressing or operation and subsequent removal to a shore hospital.

The majority of the Commission are of opinion that there should be two dressing stations easy of access and simply equipped with dressing table, cans of hot and cold distilled water and service medicine chests for the use of those slightly injured. The first of these dressing stations, which would be the ordinary sick-bay, would receive the wounded from the upper deck and batteries. The second, reserved for the wounded of the protected deck and after-parts of the ship, would be represented by the fore-part of the officers' quarters aft the protected deck. As regards the central post of the wounded, or "battle-hospital" beneath the protected deck, certain conditions must first be fulfilled if the place is to be utilisable:—

1. It must be easy of access and provided for the detrusion of the wounded with an Auffret's *goultière* and slides.
2. It should have a surface area capable of accommodating the estimated number—a direct ratio of the ship's strength—of urgent cases.
3. It must be well ventilated, well lighted, provided with an operating table, vessels of hot and cold fresh water, reserve cases of drugs and dressings, table of dressings and a war-service medicine chest.
4. Provision should be made for a number of cots proportionate to the estimated number of wounded.
5. It must not be trammelled by machinery and windlasses, in the gearing of which operators and patients might get intricated.

A place decorated with the title of *Central Post of the Wounded* not fulfilling these requirements is a mere anamorphosis. The Commission, after an examination of the several compartments beneath the armoured deck, are of opinion that not one of them in its present state fulfils the required conditions. Nevertheless, being instructed to give a decided opinion, they fixed their choice on compartment F. Two apertures of sufficient dimensions to warrant the installation of an Auffret's *goultière*

and slides give access beneath the protected deck to the central parts of the ship. Another Auffret's *gouttière* fitted in one of the large hatchways close at hand allows of the detrusion of wounded from the upper and gun decks; the ventilation of the compartment is assured. In the starboard compartment four cots can be suspended from the roof and four mattresses stretched on the deck, and more than one operating table not being required, the corresponding port compartment could accommodate fifteen or sixteen wounded. By opening the water-tight bulkhead-doors separating F and G compartments, it is possible to remove the dressed wounded into the latter. Electric light to be furnished by fixed lamps and wandering leads for the operating table; the accessory installations seem easy of realisation.

We have not altogether followed out the suggestions and proposals of the Commission; we cannot recognise two categories of wounded, and in consequence two auxiliary dressing stations, as these would necessitate a medical *personnel* and *matériel* quite beyond the scope of this ship; moreover, any surgical work in a dressing station riddled by the enemy's projectiles and reverberating with the deafening roar of our own artillery, especially of the forward guns, would be impossible. We have, however, adopted the Commission's proposals to utilise compartment F. as the hospital of combat.

The Post of the Wounded on board the "Amiral-Baudin."—Compartment F is one of the water-tight compartments of the ship slightly forward of the central point of the ship and above the stokeholds with which it communicates by two hatchways, one aft is the normal entrance, the other forward is the escape; both are easy of access and do not encroach on the space devoted to the wounded.

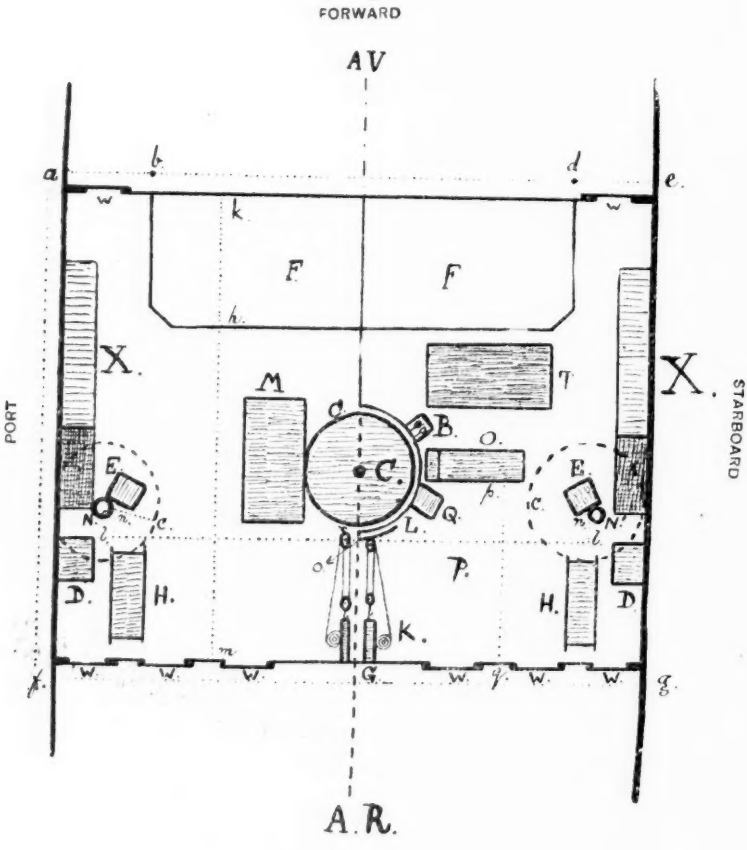
This compartment is divided into two sections by a median partition perforated by a door 3·6 feet wide, which should be kept open during action; the two parts thus sectioned off are reserved for the use of the wounded; they contain, however, certain irremovable obstacles such as a Thirion's pump, tackle, capstan brake, and the brake apparatus of the turret on the starboard side, and the motors of the capstan and turret on the port side, and common to the two sides are the funnel casing, capstan and circular shafts. The post of the wounded proper—that is to say, the place where the dressings are done and all the medical stores kept—is the starboard compartment, the port compartment merely serving as a shelter for the dressed and as a thoroughfare for the emptied Auffret's *gouttière*. The available space is 13·7 feet by 16·4 feet; 224·6 square feet for the starboard compartment, not including the space occupied by the operating table and Auffret's *gouttières*, which together occupy another 120 square feet, and about 340 square feet for the port compartment, thus allowing of the accommodation of thirty wounded lying down

side by side on mattresses, not to mention some ten cots slung from the roof. A supply of hot and cold distilled water from tanks in a neighbouring compartment is also installed.

"AMIRAL-BAUDIN."

Dispositions of the Wounded in Compartment F.

Fig 1.



AR. Turret. AV. Turret. B. Tanks of hot and cold distilled water. C. Capstan. D. Entrance hatchway to stokeholds. E. Ash reservoir. F. Funnel casing. G. Capstan brake apparatus. H. Wheel. K. Tackle for applying capstan brake. L. Door. M. Capstan motor. NN'. Circular aperture perforating the armoured deck. O. Operating table. P. Post of the wounded. Q. Medicine chest. T. Thirion's pump (500 Tx). W. Water-tight door. X. Escape-hatch from stokehold.

a-b, 5·57 ft. ; a-f, 38·38 ft. ; b-d, 38·05 ft. ; c-n, 2·62 ft. ; d-e, 5·57 ft. ; f-g, 49·21 ft. ; h-k, 10·49 ft. ; h-m, 27·88 ft. ; l-o, 13·77 ft. ; p-q, 16·07 ft.

N.N'., shafts perforating the protected deck ; the annular space surrounding the small inner circle N serves for the passage of the wounded, that on the starboard side transmitting the *gouttière* in a loaded condition, the empty *gouttière* returning by the port aperture.

Such is the post into which the wounded from above the armoured deck finally enter upon an Auffret's *gouttière*, the only apparatus of transport capable of passing through the armoured deck. The starboard aperture giving passage to the loaded Auffret's *gouttière* is in direct, constant, and easy communication with the port aperture up which the empty *gouttière* is returned. The temperature may rise to 40°C. The advantages of this post are its impregnability, relatively easy accessibility, and especially its twofold communication with the upper decks. Another strong point is its good ventilation: air enters by the two shafts N and N^1, and makes existence—despite the fact that the temperature may rise, when all fires are alight, to 40°C, though seldom exceeding 27°C with the forward boilers only in use—quite supportable. The lighting, by electricity, is good. On the whole, the installation is satisfactory, encumbrances not being numerous, and what there are not interfering with the comfort of the patients. Surgical operations could be safely performed in this post. The principal disadvantages are three: firstly, with all the fires lit up the temperature in northern regions is uncomfortable (40°C.), but in southern regions it becomes excessively so (45°C); secondly, the utilisable space is insufficient, the two compartments together not being capable of accommodating thirty wounded at the most when there ought to be accommodation for at least 60; lastly, there is no exit pipe for the discharge of refuse liquids from the post into the main drain. At any rate, this post proves that even in ships least adapted to an installation, it is yet possible to secure a well-protected and well-ventilated place for the wounded, where they may be sheltered, thus leaving unfettered the fighting deck.

Transport of the Wounded on board the "Amiral-Baudin."—The four origins or "detrusion points" whence the wounded may come are:—

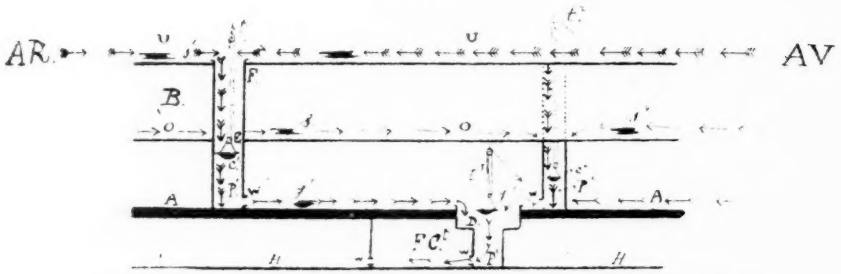
1. The casemates of the 6·42-inch guns.
2. The turrets AV and AR of the 14·43-inch guns.
3. The military fighting-tops.
4. The casemates of the 6·42-inch guns, the passages and orlop deck.

The wounded from the first three situations we shall generically designate as the "wounded of the upper deck"; the fourth class of wounded we shall call the "wounded of the gun-deck"; in order that provision may be made for every one of the ship's company, we will classify the remainder—that is to say, all those in the submerged parts of the ship on the same level as the hospital of combat, and capable of being dressed on the spot—as the engine-room *personnel*.

"Amiral Baudin."

Transport of the Wounded.

Fig. 2.



A, armoured deck ; AR, turret ; AV, turret ; B, battery (gun-deck) ; D, aperture in armoured deck ; E, aperture in orlop deck ; F, aperture in upper deck ; H, first deck of the hold ; F C^t, compartment F ; O, orlop deck.

p^1, vertical passage for descending cot AR.
p^2, vertical passage for descending cot AV.
p^3, vertical passage for Auffret's *gouttières*.

w, water-tight door ; c^1, descending cot AR. ; c^2, descending cot AV. ; g^1, Auffret's *gouttière* No. 1 ; g^2, Auffret's *gouttière* No. 2 ; s^1,s^2, upper deck stretchers ; s^3,s^4, orlop deck stretchers ; t^1, tackle for detruding cot AR. ; t^2, ditto cot AV. ; t^3, ditto Auffret's *gouttière*.

Reminding the reader of our previous remarks, that the wounded of the 14·43-inch gun turrets AV and AR must be personally visited by a surgeon, and, if their lesions are of great severity, must be removed on to the upper deck, the following plan will be adopted :—

1. Clearance of the upper deck, comprising :—
   1. Wounded of the 6·42-inch casemates.
   2. ,, ,, ,, 14·43-inch turrets.
   3. ,, ,, ,, military fighting-tops.
   4. ,, ,, ,, upper deck.
   5. ,, ,, ,, bridge decks.
2. Clearance of the orlop and gun decks, comprising :—
   1. Wounded of the 5·4-inch guns.
   2. ,, ,, ,, orlop deck.
   3. ,, ,, ,, passages.
   4. ,, ,, ,, engine-room and stokeholds.

The following plan shows at a glance the particular route taken and the means of transport used :—

a. First Horizontal Transport :—
1. Upper deck *stretchers*.
2. Gun deck *stretchers*.

b. First Vertical Transport :—
1. Descending *cot* from hatch AR in upper deck.
2. Descending *cot* from hatch AV in gun deck.

c. Second Horizontal Transport:—

1. Auffret's *gouttière* from terminus of cot AR.
2. Auffret's *gouttière* from terminus of cot AV.

d. Second Vertical Transport:—

1. The same Auffret's *gouttières*. This operation does not necessitate change of transport apparatus, the *gouttière* being lowered into compartment F through the hatchway perforating the armoured deck.

Our meaning will be rendered clearer by taking some individual examples. Every wounded man on the upper deck whether he was originally injured in a military top, casemate, turret, on a footbridge, or on the upper deck itself, is at once attended to, lifted on to a stretcher by the bearers, a subordinate surgeon supervising, and carried to the hatch AR of the upper deck, which is the upper terminus for the descending cot AR; the wounded man is transferred to this cot and lowered vertically through the orlop deck on to the armoured deck—there he is transshipped to an Auffret's *gouttière* and borne horizontally across the armoured deck to the circular aperture piercing it and connecting it with compartment F; he is then lowered through this aperture into the compartment.

A man wounded in the battery (gun-deck) or passages is lifted on to a stretcher by the bearers, under the direction of the second subordinate surgeon, and carried horizontally to the hatch AV of the 5·4-inch battery; he is removed from the stretcher and placed in the cot AV, which is then lowered vertically on to the armoured deck; there he is transshipped into an Auffret's *gouttière* and carried horizontally in this apparatus to the upper orifice of the starboard circular shaft perforating the armoured deck; through this he is lowered, still in the same Auffret's *gouttière*, into the post of the wounded.

The Auffret's *gouttières*, once emptied of their wounded, are carried across compartment F and hoisted out of it by the port circular shaft, the one being returned to the lower terminus of the upper deck cot of descent AR, the other to the lower terminus of the battery cot of descent AV.

In the event of a man being wounded on the orlop deck,[1] the stretcher-bearers manipulating Auffret's *gouttière* plying between cot AR and the starboard circular shaft, must take this *gouttière* (the normal service of communication being temporarily interrupted) and in it bring the man directly into compartment F.

Should any of the engine-room complement get wounded, a subordinate surgeon must repair to the place and dress the man there and then, and if his removal into the post be imperative he will send for

[1] Faux-pont.

an Auffret's *gouttière*, and, employing it as a stretcher, convey him to the hospital of combat.

No attempt has been made to gloss over the many defects of this installation. To subject an injured man to the agonies of three changes of transport is in itself sufficiently barbarous, but at any rate it is better than leaving him untended to die of his wounds or exposed to fresh ones; but even this installation could be vastly improved if the number of Auffret's *gouttières* were so increased that there could be an uninterrupted flow of them between the upper deck and F compartment. As a matter of fact, if the two passages, indispensable to the separate issue of wounded from the upper and gun decks were well stocked with Auffret's *gouttières*, they could be worked with surprising rapidity and with real comfort to the unfortunate wounded who, lifted up from the very spot where they fell, would be carried over the decks and lowered through the passages in the same apparatus of transport, from which they would only be removed when safely deposited in the hospital of combat.

What a mitigation of suffering, and what rapid removal! Many and repeated evolutions of removing fictitious wounded from the upper decks to the hospital of combat below prove that it is just possible to remove six to eight men per quarter-hour. A slight block generally occurs on the orlop deck owing to the small number of Auffret's *gouttières* being unable to cope with the large number of wounded brought down by the two cots. Better, however, have an obstruction on this deck, where there are no combatants, and where there is a relative amount of shelter, than on the more elevated decks, which are fields of action that must, at all costs be rid of every encumbrance if hostilities are to be kept up. If this ship was provided with six or eight Auffret's *gouttières*[1] direct transport, without any transshipment, from the upper decks to the hospital of combat would be possible. Upon our future battle-ships and large armoured cruisers we hope to see these multiple routes replaced by two passages proceeding direct from upper deck to post.

Having described the post and passages as they exist on the "Amiral-Baudin," all that now remains to us is to render an account of the organisation of the medical service on board during battle.

Duties of the Medical Personnel during Battle on the "Amiral-Baudin."

1. *Preparation for Battle.*

a. The second sick-berth steward and stretcher squads of compartment F lower Rouvier's chests, the dressings, surgical

[1] Auffret's *gouttières* are neither costly nor unwieldy, as they are said to be by the Superior Council of Health of 22nd November, 1898. Commanding officers have assured us they can easily accommodate ten or fifteen *gouttières* in each ship. Their cost, at 150 francs apiece, would only entail an expenditure of 1,500 francs per ship, a not very extravagant sum upon vessels costing 30 millions at least.

chests, dressing cases, operating table, six cots, all the mattresses and bedding of the sick-bay, four stretchers, two Auffret's *gouttières*, basins, buckets—in a word, all the *matériel* necessary for working the passages, into compartment F.

b. The stretcher squads of the upper and gun decks rig up the tackling of the descending cots AV and AR. The squad on the orlop deck make ready the elevating gear for hoisting Auffret's *gouttières* through the port circular hatch, the squad of the gun-deck fitting up the requisite lowering apparatus of the other *gouttière* in the starboard circular hatchway.

c. The various passages equipped, all the *personnel* repair to F compartment and wait, under the superintendence of the P.M.O., until the captain sounds "*la visite.*"

2. *Detrusion of the Wounded.*

At the call "*la visite,*" which will be sounded at the commencement of the lulls or at the conclusion of the battle:—

a. The upper deck and battery squads, each directed by a subordinate surgeon, repair on deck, the former by the port stokehold hatchway, the latter by the starboard, bringing with them the landing stretchers, they then proceed to move the wounded, and, placing them in the cots AV and AR, lower them on to the armoured deck.

b. The orlop deck squad come up to the stokehold hatchways bringing with them the Auffret's *gouttières*, they remove the wounded from the cots and transfer them to the *gouttières*, which are then carried to the starboard circular hatchway and lowered into compartment F. The squad then hoists up the empty *gouttière* through the port circular hatchway. As these various operations are only capable of being carried out in the intervals of hostilities or at their close, those combatants not wounded will be able to lend a helping hand in the translocation of their maimed comrades.

c. The squad in F compartment, directed by the second sick-berth steward, receive the Auffret's *gouttières* successively descending by the starboard circular hatch, remove from them the wounded, and then return the empty *gouttière* up the port circular hatchway.

Transport of Wounded in the "Amiral-Baudin."

Distribution of the *personnel*.	Upper Deck.	Squad of the Gun Deck.	Orlop Deck.	Compartment F.	Remarks.
Rating.	1. 5 qm. Second-class boatswain's mate (a). 2. Seaman (b). 3. Warrant Officer's cook (c).	1. 6 qm. Second-class boatswain's mate. 2. Seaman. 3. Officer's cook.	1. First-class boatswain's mate (d). 2. Commander's steward (e). 3. Officer's steward. 4. P.M.O's. steward. 5. Captain's cook. 6. Seaman.	1. Second sick-berth steward (f). 2. Bearer. 3. Captain's steward (g).	The whole of this *personnel* remain in compartment F until *la visite* is sounded.
Apparatus of Transport.	Two landing-party stretchers.	Two landing-party stretchers.	Two Auffret's *gouttières*.		
Supervisor.	Subordinate surgeon.	Captain of the Holds (k).	Accountant Officer (h).	P.M.O.	
Method of Transport.	Upper deck squad collect wounded, and remove them on stretchers to the cot of descent AR, in which they are lowered on to the armoured deck.	Gun-deck squad collect the wounded, and remove them on stretchers to the cot of descent AV, in which they are lowered on to the armoured deck.	Orlop-deck squad transfer wounded from the cot AV and AR to Auffret's *gouttière* in which they carry them to the starboard circular hatchway, and lower them into F compartment.	Compartment F squad remove wounded from Auffret's *gouttières* and return the latter empty up the port circular.	The whole of this *personnel* repair to compartment F, when the *marche des zouaves* is sounded.

(a) Quartier-maitre de manœuvre. (b) Matelot sans spécialité. (c) Cuisinier des maîtres. (d) Second maître de manœuvre. (e) Maître d'hôtel de l'officier en second. (f) Second-maître infirmier. (g) Maître d'hôtel du commandant. (h) Officier d'administration. (k) Maître-magasinier.

d. If during the operation of lowering the wounded, the captain considers it advisable to interrupt the proceedings, he sounds the *marche des zouaves*, when the *personnel* of the passages will, after lowering any wounded that may be in cots, immediately resort to the rallying point in compartment F.

As to the particular duties of the medical officer in war, there is no doubt but that he will at some time or other have to take active measures, be they in the lulls of the engagement, or at its close; in the first case, he will confine his attention to arresting alarming hæmorrhages and occluding as antiseptically as is possible under the circumstances the larger wounds. On the cessation of hostilities, his task of ministering to the wounded will be considerably lessened by his having not only all the resources, but all the space of the ship placed at his disposal. If the fleet of which the ship is part complement proceeds to the vicinity of a hospital, either a ship-hospital or hospital on shore, he will discharge his wounded thither, but if the exigencies of war compel a prolonged sojourn at sea, he will have to do without these institutions, and must be prepared to take upon himself all the responsibilities. To draw up a hard and fast line of conduct for the surgeon is impracticable. As one of the most competent authorities on this subject, Director Auffret has said:—"I dare not sketch out any particular procedure for my colleagues during battle. Their intervention, I have every reason to believe, should be limited

to operations of extreme urgency, sound and rapid dressings, antiseptic applications, etc. I do not wish to dissuade, but must state that I have little faith in major operations in such an environment. . . . . Who is to say what ought and what ought not to be done? The surgeon should take as his motto the *macte animo* of the poet and do what he can; in doing this he will have done what he ought. He knows well the obligations he owes his profession, and should be thoroughly convinced of the powers of his art. From his own personal experience, from his greater or less acquaintance with the scalpel, from the special conditions of his environment—above all, from his inner conscience, will he determine his line of conduct."

Conclusions.

1. Up to the present, posts and passages of the wounded not having been regarded in the light of appliances of as vital import to the attainment of the objective—victory—as are the means of destruction and the methods of offence and defence, the ministerial prescriptions relative to these posts and passages have not been satisfactorily complied with.

2. The thorough and scientific installation of an armoured post of the wounded, and of pervadable passages in communication with it, is absolutely indispensable, and ships of war should no more go into action without them, than regiments without their ambulance.

3. Detailed rules concerning the utilisation of *matériel* and organisation of *personnel* for the removal of the wounded from the upper decks of a ship into a place of shelter during battle, can and ought to be inserted in the Regulations of the Service afloat and in the war regulations as they are for all other branches of the Service.

THE UNITED STATES NAVAL MANŒUVRES, 1902.

THE FIRST PHASE.

THE Manœuvres this year were divided into two periods. The first of these was purely naval, and lasted from 20th August to 24th August; while the second consisted of combined operations between the Army and Fleet, which lasted from midnight 29th August to noon 6th September. From midnight 29th August to midnight 31st August was devoted by both sides to preparation, hostilities actually beginning at midnight, 31st August.

The following ships were engaged during the first period, and were divided into the Blue and White squadrons, respectively :—

Blue Squadron under command of Rear-Admiral Higginson.

First-class battle-ships—"Kearsarge" (flag-ship), "Alabama," "Massachusetts."

First-class armoured cruiser—"Brooklyn."

First-class cruisers—"Olympia," "Cincinnati."

Third-class cruisers—"Montgomery," "Mayflower."

Gun-boats—"Gloucester," "Scorpion," "Peoria."

Destroyer—"Decatur."

Special-service vessels—"Hist," "Leyden," "Nina," and seven first-class torpedo-boats.

White Squadron under command of Commander Pillsbury.

Special ships, representing first-class battle-ships—"Panther," "Prairie."

Special ship, representing second-class cruiser—"Supply."

The General Idea.—The strategical scheme of the naval manœuvres was based on the idea that an enemy's force was crossing the Atlantic with the purpose of seizing an anchorage suitable for an advanced base upon the American seaboard between Portland, Maine, and Cape Cod. The scheme presented some analogies to the conditions which presented themselves to Admiral Sampson when Admiral Cervera went westward.

Manœuvre Instructions.—The following are the instructions sent by the Navy Department to Rear-Admiral Higginson and to Commander Pillsbury

with reference to the naval manœuvres which began at noon on Wednesday, 20th August:—

Sent to Rear-Admiral Higginson: General information for Blues—

"At noon, 20th August, you will receive a despatch stating that an enemy's fleet has been sighted in a given latitude and longitude on 18th August, steering west. They are known to have left Fayal on 14th August, and consist of three heavy ships, with supply vessels and colliers. These auxiliaries are not represented in the manœuvres. At the above time the vessels of your fleet must be at anchor in port or near the coast. You have reliable information that the enemy is to seize an undefended anchorage, suitable for his use as an advance base, somewhere on our coast between Portland, Me., and Cape Cod. Portland Harbour is included, but not Casco Bay. He will succeed in this, unless you oppose a superior force to him at sea, or in the port he has seized within six hours after the anchorage of the first of his vessels."

Sent to Commander Pillsbury: General information for the Whites—

"At noon, 20th August, you are to be with the vessels under your command at some point in the North Atlantic, which is less than 480 miles from latitude 40° north and longitude 50° west. You are then to proceed with all your vessels in company to such undefended anchorage as you may select on the coast of the United States between Portland and Cape Cod, and anchor there before noon 25th August. The harbour of Portland is included within those open to you, but not Casco Bay. The port selected must have an anchorage space for several large ships, with not less than six fathoms of water, must be capable of gun and mine defence, and be in all respects suitable for an advance base for an enemy's fleet, including heavy ships. This carries with it as a condition suitable deep-water approaches from the sea. It is assumed that you would at once commence mining and fortifying the port seized, and you will be considered successful in this unless Blue opposes a superior force to you in less than six hours after the time of the anchorage of your first ship in port."

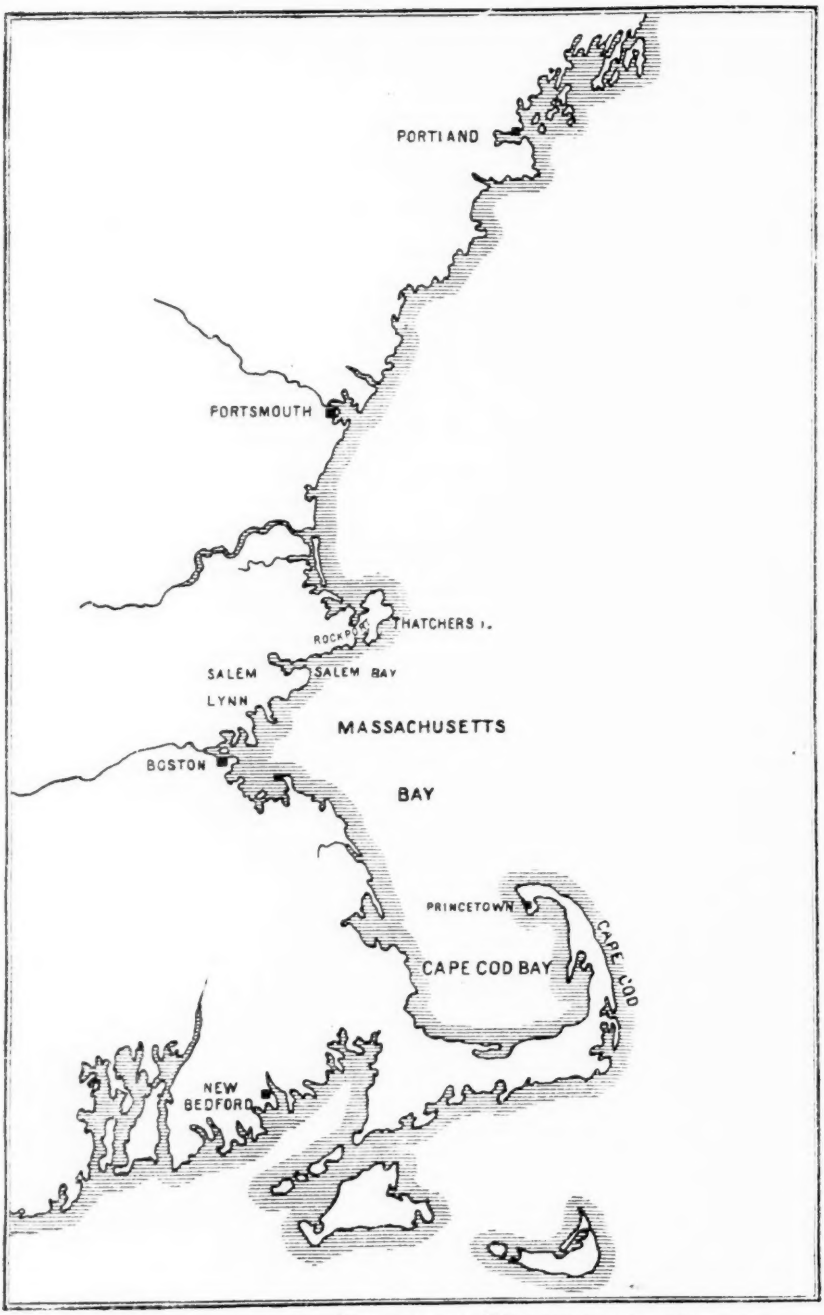
The following value is to be placed upon the vessels:

White—"Panther," 20; "Prairie," 20; "Supply," 5. Total, 45.

Blue—"Alabama," 20; "Kearsarge," 20; "Massachusetts," 20; "Brooklyn," 8; "Olympia," 8; "Cincinnati," 3; "Gloucester," 3; "Mayflower," 3; "Montgomery," 3; "Scorpion," 3; "Hist," "Leyden," "Nina," "Peoria," and seven torpedo-boats, 1 each, making a total of 102.

These values are for the purpose of determining relative strength.

No torpedo attack is contemplated as part of the manœuvres. The torpedo-boats may be used as scouts and to carry despatches, and have a fighting value of one each when accompanying battle-ships. In case the vessels of the opposing forces come together, the Blue, to win, must



OUTLINE OF COAST OFF WHICH FIRST PHASE OF MANŒUVRES WAS CARRIED OUT.

have a superior force, composed preferably of battle-ships and heavy cruisers. The purpose of the Blue in the problem is to find the White fleet and bring a superior force against it, either at sea or in the port where it has established itself. Blue can utilise any existing facilities of telegraph or telephone, or any that can be created.

Rear-Admiral Higginson has been authorised to employ agents or look-outs all along the coast threatened. Blue's largest scouts are hypothetical—supposed to be American line steamers. One of them supposed to make the initial report, and then take no part in the further manœuvres.

Both Blue and White are absolutely unrestricted as to speed and movement after 20th August. The time assigned in White's orders is not known to the Blue admiral. In case the White fleet becomes separated, the time of the anchorage of the first one to reach port is to be taken as that of the fleet.

The Result of the Operations.—The result of the naval war game between the Blue and White Squadrons was the capture of the White Squadron in the harbour of Salem, Mass., early on the morning of 24th August, an hour after it had succeeded in effecting its entrance. At dawn Rear-Admiral Higginson's flag-ship, the "Kearsarge," and her consorts, the "Alabama" and "Massachusetts," were at anchor close to Thatcher's Island and within three miles of Rockport, Mass., which is 36 miles north-east of Boston. Commander Pillsbury's squadron, representing the enemy, was discovered shortly after daybreak. At that time Pillsbury's ships were about 15 miles to the southward of the "Kearsarge" and heading north-east. Within ten minutes after the alarm was given the "Kearsarge," "Alabama," and "Massachusetts" were under way in pursuit of the enemy, who were making for Salem harbour. At half-past five Rear-Admiral Higginson followed the enemy into Salem Bay and summoned Commander Pillsbury to surrender. Five minutes afterwards this demand was complied with, the commander of the White Squadron realising that the game was up.

Commander Pillsbury's squadron sailed from Provincetown, Mass., on 18th August, while Admiral Higginson's squadron left Rockport, Mass., in the afternoon of 20th August. At noon on the 20th the White Squadron arrived at its appointed station, some 480 miles from the coast, and Commander Pillsbury appears to have first headed south some 40 miles, and then to have altered course to the west towards the enemy's coast; at 4 a.m. on the 21st, having run some 100 miles towards the enemy's coast, course was again altered to the south-west, the weather being dark, threatening, rough and rainy. At 1 p.m., having made some 80 miles to the south-west, and being below

the latitude of New York, course was altered to W.N.W.; during the night the weather cleared, the squadron steaming with lights out, and extra look-outs posted, communication being maintained between the ships by means of an electric light towed astern under water, which seems to have answered well. During the 22nd the sea was smooth and weather clear, and the squadron found themselves in the track of vessels bound to and from New York. During the night of 22nd—23rd the squadron proceeded with masked lights, course having been altered to the north, the night cloudy with a heavy thunderstorm. During the 23rd, many fishing-boats on the George's Bank were passed, but, although the international code of signals was used, no information was obtained. The night of the 24th was brilliant with moonlight, and soon after midnight Thatcher's Island lights were sighted ahead. As it was impossible to advance much further without being seen from the land, and it was still too dark to enter Salem Harbour, course was altered to the south-westward and the squadron headed toward Boston. At dawn the land around Salem began to loom up. The squadron was but five miles from its goal, having successfully eluded the enemy's scouts, even his inshore pickets, and it was hoped that he might still be without information, through the failure of his scouting system, but at daylight his battle-ships were observed at anchor off Thatcher's Island, and although Commander Pillsbury succeeded in entering Salem Harbour, within an hour afterwards he had to surrender to the superior defending force.

The movements of the Blue Squadron were as follows:—Upon departing from Rockport in the afternoon of 20th August, the "Mayflower" was put on the look-out off Portland, Me., the "Decatur" off Portsmouth, N.H., the "Scorpion" off Boston and Provincetown, and the "Montgomery" between Provincetown and Chatham. The line of defence thus placed under patrol extended from Provincetown, on Cape Cod, to Portland, Me., with both ends admirably guarded against surprise. Admiral Higginson, therefore, after his battle-ships had skirted Cape Cod, assembled them near Thatcher's Island, where he was in easy reach of both ends of the line, and there they remained at anchor until the enemy was sighted on the morning of the 24th. During Commander Pillsbury's absence from the coast frequent alarms were given that he was approaching, but they were all misleading. The signal service of the lighthouse and life-saving services are reported as having been excellent, but not the telephone communications between those points. In expressing his satisfaction with the general results of the game, Admiral Higginson is reported to have said that the working out of the search problem had proved that the signal service of the Navy was very much behind the times. "There is an emphatic need of the installation of wireless telegraphy for naval vessels,"

said the admiral. "We are three years behind every other nation in this necessary feature. We hope, however, to have it in use on our ships next year."

The following is the report of Rear-Admiral Higginson to the Secretary of the Navy:—

"U.S. Flag-ship 'Kearsarge,'
Menemsha Bight, Mass.,
25th August, 1902.

I have the honour to report that at 5.40 a.m. of the 24th inst., off Magnolia, Mass., the Blue Fleet, under my command, captured the White Fleet, under the command of Commander John E. Pillsbury, U.S.N., after four days of anxious watching. Commander Pillsbury's fleet was deficient in speed. His evasion of the outside scouts and arrival on the coast undetected were, I think, very creditable to him.

The result of the operation, in regard to my own force, was to gather very valuable information for the Intelligence Office concerning the capabilities of defence and means of communication along the stretch of New England coast from Cape Cod to Portland. This information is valuable and should be preserved for future use. I directed the observers at the different stations to answer the questions on the enclosed list in regard to the point at which they were stationed.

The line of coast over which I had charge was divided into five (5) districts, each in charge of an officer provided with scouting vessels and a number of observers at shore stations. These districts all reported by telephone or telegraph, or by whatever means of communication they could establish, with the central district at Rockport, where Ensign Barry, U.S.N., was in charge of the central office and transmitted to me by means of steam launches, torpedo-boats, and signals from shore whatever information was received.

The reports of the district commanders and observers will be forwarded to the Department for its information.

I can only say that the operations have been very beneficial in training the young men in scouting and as observers. I take this occasion, however, to urge upon the Department the establishment upon all vessels of the Navy a wireless telegraphy outfit. In my opinion, it is of incalculable value and no expense should be spared to hasten its adoption.

The squadron has been withdrawn to Menemsha Bight preparatory to the combined Army and Navy manœuvres."

"North Atlantic Station,
U.S. Flag-ship 'Kearsarge,' 1st Rate,
Menemsha Bight, Mass.,
25th August, 1902.

Squadron Special Order No. 21:

The special order issued by Rear-Admiral Higginson, and referred to in his report as containing the questions to be answered by the observers at the different stations, follows:

The commanding officer of the scouting districts and all observers are to make reports on the search problem as far as their special duties extended. In making up their reports they will answer the following questions as far as they pertain to the duty they were employed upon:

1. What means of communication did you use or establish?
2. What other means would you suggest (outside of wireless telegraphy)?
3. What difficulties did you encounter in keeping up the communications, or of reporting to stations?
4. Could you reach all places by telephone and what centres did you have to go through?
5. What stations did you establish, and were they efficient?
6. What other stations would you establish now after the experiences of this problem?
7. What accommodations were found for lodging and subsistence?
8. What should be the outfit of stations to suit the conditions you found?

FRANCIS J. HIGGINSON,
Rear-Admiral,
Commander-in-Chief, U.S. Naval Force,
North Atlantic Station."

THE SECOND PHASE.

The Combined Army and Navy Manœuvres.—On 3rd January, 1902, the Chief of Artillery, U.S. Army, Colonel Wallace F. Randolph, Artillery Corps, addressed the Headquarters of the Army, suggesting that an invitation be extended to the Navy Department to enter into combined manœuvres with the Army during the coming summer, with the view of testing the state of efficiency of the coast defences defending the approaches to New York. After some correspondence between the two departments the suggestion was agreed to.

It was settled that the period of preparation was to begin at midnight 29th August, and end midnight 31st August. The period of hostilities

beginning midnight 31st August, and ending noon 6th September. The final discussion of the problems connected with the manœuvres was to take place at the Naval War College at a date after the manœuvres had come to an end.

General Idea.—Anticipating the declaration of hostilities, a strong enemy's fleet (without torpedo-boats) determines to make a sudden dash upon Newport, or the eastern entrance of Long Island Sound, to secure a naval base, taking advantage of the absence of a declaration of war to find the land forces somewhat unprepared.

Special Idea.—1. In undertaking these operations, the controlling idea should be to test the training of the *personnel* and the efficiency of the *matériel*, and it is of paramount importance that this idea should not be lost sight of.

2. The period of the manœuvres is to be divided into two distinct phases: (*a*) Period of Preparation; (*b*) Period of Hostility.

3. It is desirable that attacks or feints should be made all along the line so as to test the efficiency of each part of the line, rather than to have one main attack upon some prominent point, thereby allowing enthusiasm and interest at other places to wane by a feeling of fancied security.

4. The attacks by the fleet should embrace a day attack and a night attack, and, if possible, a bombardment and a forcing of a passage.

5. This coup being made before a declaration of war, it will be assumed that prior to the period of preparation no channels are mined or obstructed; thereafter mines and obstructions may be placed.

6. During the period of hostilities the conditions are to approach those of war as closely as possible.

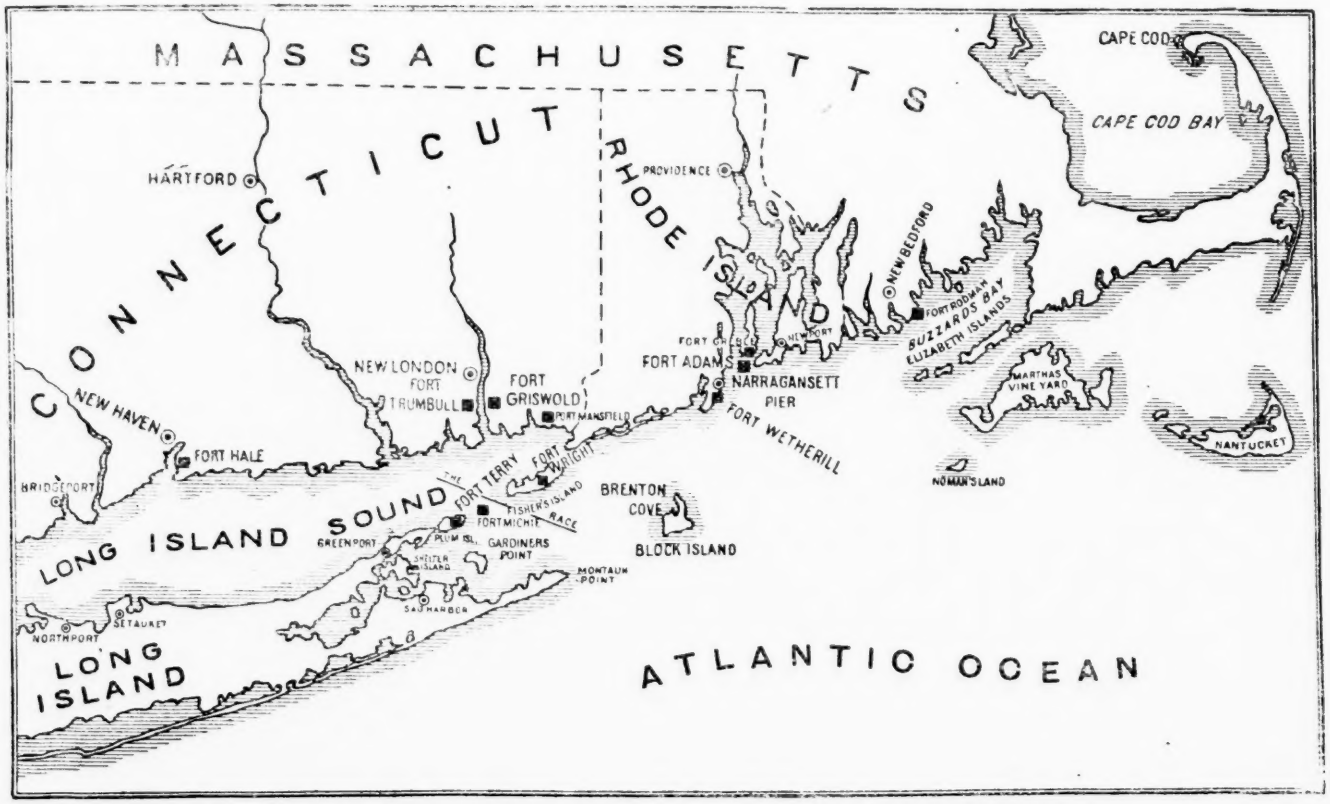
Information to be Obtained.

For the Army.—General features of attack on posts and the defence of same; the most efficient way for district commanders to exercise command of the defences of artillery districts in action, including the practical co-ordination of such defences as a whole; the use of movable armaments; the best system of fire control and direction; the practical determination of "areas of greatest advantage" for each fort; a simple and reliable method of communicating orders and information from fire commanders and battery commanders to gun emplacements; the best use of search-lights in detecting the approach of an enemy; the best location of search-lights together with all information as to the use of same in connection with the fire of guns on ships at night; the location of range-finders, and the comparative merits of depression and horizontal base systems; systems of signals by search-lights between forts; the best method of conducting the work of security and information, and the

utilisation of commercial life-saving and lighthouse stations; the practical application of wireless telegraphy and use of balloons; the number, type, calibre, and mounting of guns at each fort, and the sufficiency and adaptability of same to purpose intended; type and number of emplacements, material composed of, construction, durability and strength, interior arrangements, suitability of site, plan, elevation, and position with reference to other emplacements, and to enemy's guns on front, flank, and rear; facilities for *personnel* to pass from one emplacement to another; convenience as to location of ammunition delivery tables, or the points at which ammunition is received by the cannoneers from the ammunition detail; effect of fire of guns in and about emplacements in the target practice preceding the naval attack; means of lighting inside and out; locations and dimensions of replotting, telephone and telautograph booths; condition of rooms and galleries as to dryness; drainage and ventilation; convenience of location of armament chests, loading implements, tools, etc., and provisions made for same; efficiency of ammunition service; the condition and efficiency of all electrical plants and appliances, including power plants, generators, storage batteries, power rooms, lamps, switchboards, motors for hoists and for manœuvring guns and carriages, electrical firing devices and method of using cables, wires, conduits, telephones, and telautographs.

For the Navy.—The best method of obtaining the ranges of the forts and batteries fired at, the means of communicating these ranges to the divisional officers, the designation of the target to the divisional officers; the effect of smoke in concealing the target (as far as possible, in view of the limitations imposed by the simulated fire of the heavy guns), the order of fire in the ship considering the direction and force of the wind; the effect of mines and obstructions on the progress of the ships.

For the Admiral.—The best method of concealing his approach; in the attack, whether it is possible to designate separate targets for the different ships after the action has begun, or to cease firing at certain batteries that he deems to be silenced, and to concentrate the fire of the ships on the remaining batteries; the method of manœuvring under fire; considering the character of the channel, the best formation to be used, the distance between ships, and the speed; the efficiency of the signals used; the method of attacking in a fog, or by night; the use of search-lights for lighting the target and for blinding the eyes of the opposing gunners or range observers; whether to direct the beams at the guns or at the range-finders; whether desirable to use search-lights from all the ships, or from a few, the others remaining in darkness and firing at the targets illuminated by the search-lights of the few; the method of preventing the crossing of the beams and the forming of dark sectors beyond; the blinding effect of the opposing search-lights, both on navigation and on aiming at the



OUTLINE OF COAST SHOWING THE SCENE OF THE COMBINED ARMY AND NAVY MANŒUVRES.

designated target; the possibility of shielding the eyes and looking under the beam; the methods to be adopted in forcing mined and obstructed channels.

General Instructions.—The following are the principal regulations which were laid down. 1.—In pursuance of paragraph 1, of the Special Idea, it must be borne in mind that the object of the manœuvres on either side is not primarily to win, but to investigate and test certain systems and problems of attack and defence. To this end it is desirable that all units shall remain in action during the whole of the manœuvres.

2. The attacking fleet is to be under the sole direction of the Commander-in-Chief of the naval force. As he is a hostile officer, he will not be given any instructions during the period of the manœuvres, nor will he hold any intercourse with the shore except under a flag of truce. He will allow no boats of any kind to come alongside. If he wishes information, he will seek it only as he would in war. All American merchant shipping is supposed to be in port.

3. The defence will not know more of the plans of the hostile fleet than it would in actual war. Under no circumstances shall the time be designated for any evolution or phase of the manœuvres.

4. A naval base may be established at the discretion of the Commander-in-Chief of the naval force; if outside the line of defence, the Army cannot and is not expected to prevent such establishment.

5. There shall be no landing parties except on the Government or military reservations. Plans of these reservations shall be furnished by the commanding general of the shore forces, showing the limits. During the period of hostilities flags shall be established on shore to mark the boundaries of the reservations. These shall be regulation signal flags, which, being stationary and not waved, will not create confusion. The location of the flags will not be shown on the plans, but generally there will be one at each shore termination of any boundary line, and one at each pronounced change in its direction.

6. On board ships R.F. guns will fire blank charges; the larger calibre guns will fire sub-calibre blanks. On shore all guns will fire blank charges. On account of the special character of the firing the rate of fire of all guns will be assumed to be that laid down in the rules for each calibre, as determined for service conditions, and will be so counted.

7. All commissioned officers of the Army and Navy participating in the manœuvres shall submit duplicate reports to the commanding officers embracing both a record of events and pertinent comments on all matters of professional interest that have come under their notice.

8. Full reports, embodying their own observations and the reports of their subordinate officers, shall be submitted by the commanding

officers of the forts and ships to the commanding general of the shore forces (through district commanders) and to the Commander-in-Chief of the naval force respectively.

9. The commanding officers shall have the right of protest against any ruling of an umpire.

10. Any communications between hostile forces must be made under a flag of truce. This will be indicated at night by a white flag with search-light on it shown at a convenient point.

11. The ships will not use any of the aids to navigation in their attacks (supposed for this purpose to be non-existent) unless it becomes a question of the safety of the ship.

12. An umpire called on to make a ruling, where an immediate ruling is plainly required, shall at once inform the commanding officer.

13. Signal stations will be assumed to be exposed to the same risks as in actual war.

14. Any mines placed after the beginning of the period of preparation must be fully connected and in working order. They are to contain dummy charges and dummy fuses only; but a live fuse is to be placed in the external circuit of each mine, at some convenient point for observation and inspection. In case the attacking force passes over a minefield, without first clearing the channel, or severing the connections, any ship that comes in contact with a mine and closes its circuit, as indicated by the blowing of the fuse in the external circuit, will be considered out of action, and will be so noted by the shore umpire in his report to the Board of Arbitration, but no ruling shall be made at the time. Any ship within the radius of destructive effect of an observation mine, or group of such mines, at the time the circuit is closed by the observers shall be considered out of action.

15. Channels are allowed to be obstructed after the beginning of the period of preparation. This, however, is to be done only constructively. It is assumed that under the conditions of war, during the period of preparation, a number of hulks of varying dimensions, the number not to exceed what might reasonably be obtained during the two days of preparation, may be sunk in selected positions in the field of manœuvre. On or before 27th August, the naval commander will be furnished sketch maps and memoranda sealed and showing the proposed locations and the character of the hulks. There shall be fifteen (15) copies of the information in separate sealed packages. Before the manœuvres begin each umpire afloat shall be provided with one of the sealed packages. He shall consider all naval operations in the light of this secret information, and as steps are taken by vessels to investigate channels he shall release reasonable information as to the state thereof

with regard to obstructions. The umpire must report all the circumstances for the decision of the Board of Arbitration.

16. A scout attempting to gain information by running the batteries in the daytime, as in a fog, will be considered out of action and will retire, if, in the judgment of the umpire on shore, she has been seen in time and has received enough fire to put her out of action.

17. As some of the principal objects of the manœuvres are the testing of the fire control, fire discipline, rapidity of fire, value and accuracy of range-finders, and the handling and effect of search-lights, particular attention shall be paid by the umpires and observers to the workings of these systems. Efficiency or defects in the workings of any or all of these will be noted and commented upon in their report.

18. The effect of search-lights upon gun fire or upon the navigation of the ships cannot be indicated by an arbitrary rule. From all the available reports, the Board of Arbitration will decide the effect and estimate its value in points to be counted against the life of the battery or ship, as assigned by the rules.

19. A ship blinded or wishing a search-light turned off her conning tower or bridge shall blow a long blast of the whistle. The beam of the light must be turned to the after part of the ship immediately. If she is still inconvenienced in her navigation, she shall blow two long blasts of the whistle, when the light must be turned off that ship altogether. The times and other points of value are to be noted on both sides.

20. In an attack upon an entrenched position ten times the number of the defenders of such position actually engaged shall be required to take it, and the casualties suffered by the assailants shall be twice the whole number of the defenders. The two umpires on the spot shall decide. If one only is present, he shall decide, after conference with the two commanders.

21. In estimating the effect of gun fire, the number of shots fired under the practice conditions of the manœuvres shall not be considered to exceed the average rate of fire for each calibre as determined under service conditions from reports of target practice. If the number falls below this rate, or in case of any accident to gun mechanism or in the service of ammunition, the rate is reduced below the normal average, then the actual number of fires is to be counted.

The following table affords an approximate rate of fire for guns of both Services. It is as nearly correct as it can be made with information now available. It will govern during the manœuvres, subject to modification by the Board of Arbitration in their discretion and in the light of subsequent reliable data:—

Small R.F., 6 seconds, 4-inch R.F., 15 seconds; 4·7-inch R.F., 20 seconds; 5-inch R.F., 20 seconds; 6-inch R.F., 30 seconds; 8-inch B.L.R.,

105 seconds; 10-inch B.L.R., 120 seconds; 12-inch B.L.R., 150 seconds; 12-inch B.L.M., 180 seconds; 13-inch B.L.R., 180 seconds. Guns of old types are to have their actual fires counted, to which values are to be assigned, as the Board of Arbitration may decide.

22. The following rules for the value of gun fire will govern, subject to modification by the Board of Arbitration, as in the case of the rates of fire. They are based on these general ideas: The Navy guns have from 85 per cent. to 10 per cent. of the accuracy of Army guns at similar targets, according to the range. The values of hits are proportional to the striking energy of the projectile, and decrease with the value of the protection afforded by the target. The angle of fall affects the extent and vulnerability of target both of ships and forts. The angle of presentment affects the value of the hit. A ratio exists between the vulnerable targets presented by ships and batteries at various ranges. Shore batteries cannot be destroyed by ships except by an overwhelming fire, but they may be temporarily silenced. A certain number of shots of a given calibre will destroy a ship, or silence her R.F. and auxiliary batteries, or destroy or silence a single gun, depending on the vulnerability and size of target presented. Combining all the above, each shot fired may be assigned a value in points, and ships and batteries may be assigned a life in points. Also the rate of fire per minute necessary to silence a gun or battery admits of estimation in points. The accompanying tables are self-explanatory. They give the value of each shot fired, in view of all the above considerations. The life of ships, batteries, and accessories is estimated for day conditions. Their life at night is assumed to be greater, and this has been allowed for by assigning a night value in points rather than by reducing the value of each shot fired, which would necessitate new tables. By night is meant after daylight, when guns cannot be sighted except by the aid of artificial light. A distinction is made between silencing and destroying forts and ships. All shots fired count against the life of the forts or ships. If the rate of fire per minute from ships' guns reaches a certain limit, the guns fired at are silenced for that minute. Similarly the rapid fire and auxiliary batteries of ships may be silenced by a certain rate of fire per minute from the forts. A single proviso is made for obvious reasons. The value of fire in points delivered by guns of 6 inches, and lower calibres shall not be counted against the life of the opposing ships or forts except in co-operation with the higher calibres. Without such co-operation they count in silencing, but not in destroying.

23. A final opinion is expected from each commanding officer ashore and afloat of the sufficiency of the present fixed defences and of their relative value at night or in thick foggy weather; also to what extent mines and obstructions are applicable, whether there are enough search-

lights and rapid-fire batteries to cover the mine fields and prevent counter-mining, and whether some mobile defence is necessary for the same purpose in thick or foggy weather or at night.

24. Suggestions for changes or modifications in the rules, or for new rules to meet conditions that are not now provided for, would prove of value in future manœuvres.

The Forces Engaged.—The following were the forces engaged on each side :—*Naval.*

Battle-ships—"Kearsarge" (flag-ship of Rear-Admiral Higginson), "Alabama," "Massachusetts," "Indiana," "Puritan."

Armoured cruiser—"Brooklyn" (flag-ship of Rear-Admiral Coghlan).

Cruisers—"Olympia," "Cincinnati," "Panther," "Montgomery," "Mayflower."

Gun-boats—"Gloucester," "Scorpion," "Peoria."

Special-service vessels—"Supply," "Aileen," "Nina," "Leyden."

Shore Defence.—The forts in the Artillery District of Narragansett, including Forts Rodman, Adams, Wetherill, and Greble; and in the Artillery District of New London, Forts Mansfield, Wright, Michie, Terry on the fort on Gardiner's Point. These were mobilised on a war basis, allowing two reliefs of artillerymen. No torpedo-boats were used on either side. Major-General MacArthur was in command.

There were 9 Army and 15 Navy umpires appointed, with 12 Navy and 13 Army observers. The Army observers and Navy umpires were embarked on the 29th August, and distributed among the different ships; and the Navy observers and Army umpires were distributed among the shore stations on the same day.

It was understood that when hostilities commenced at midnight on the 31st August, the coast defences were not fully ready and also that the American fleet was absent and could not return in time to afford assistance during the limits within which hostilities were to last. The order for the troops to mobilise for the defence of the coast was given on the 29th August.

The Preparations.—During the two days of preparation the fleet lay at Menemsha Bight, where they coaled and completed with stores.

The land preparations were on a more extended scale.

The Army engineers were busied in laying submarine mines, and the Ordnance in supplying blank ammunition, fittings for gears, cables for signalling, etc., and the Signal Service men were setting up the electrical appliances at the forts or testing their efficiency. The headquarters of the army commander, Major-General MacArthur, and the chief-of-staff corps were not in the saddle, but on board small steamers, which plied to and fro between the shore and the forts. General Greely had provided a number of automobiles, which were found very useful for land trans-

portation. In spite of the short time allowed them, the engineers, under directions of General Gillespie, succeeded in establishing a very complete system of mine defence. They also furnished the umpires on board of the war-vessels with a list of channels supposed to be blocked by sunken hulks which made them taboo. On land, from Fort Rodman, at New Bedford, to Fort Mansfield, off Montauk Point, every fortification was manned by artillerymen, and every headland was patrolled by signalmen just as carefully as if a really hostile fleet were about to descend upon this part of the coast. Ammunition was arranged so as to be as handy as possible to the guns, the 12-inch mortars were altered to facilitate electric firing, sub-calibre tubes were placed in the bores of the large guns, search-lights were placed in advantageous positions, the telautograph and the other means of communication put in order. More telegraph stations were established and rockets provided for night signalling. One of the new contrivances was a new signal rocket, which, on exploding, throws out a parachute carrying for some time a series of lights of different colours, which may be adjusted by the operator so as to burn in any desired sequence, giving permutations due to five elements, that is 120. The addition of a sixth light would give 600 permutations, or make a single rocket capable of responding to that number of messages of a code. These rockets were first invented during the Spanish war, but were not at first satisfactory. They have been since improved, but their reliability has not been sufficiently proven to admit of their adoption for the Signal Service. Two balloons were sent to Point Judith, but they went astray on the railroad and arrived too late to be properly tested.

Saturday and Sunday, 30th and 31st August, were in part devoted to target practice at the forts, the guns as a whole responding accurately to the indications of the position-finders and the computed range tables. The accuracy of the mortar firing was especially remarkable. The mortars were fired at intervals of ten seconds, and four shells were in the air before any of them were seen to strike.

The Operations.—The following is the report of Rear-Admiral Higginson to the Secretary of the Navy :—

"The Fleet, composed of "Kearsarge," "Brooklyn," "Alabama," "Massachusetts," "Indiana," "Puritan," "Olympia," "Panther," "Montgomery," "Mayflower," "Gloucester," "Scorpion," "Supply," "Aileen," "Nina," "Leyden" and "Peoria," having rendezvoused Menemsha Bight by sundown Sunday, 31st ultimo, they were assigned as follows :—

First Squadron—1, "Kearsarge"; 2, "Massachusetts"; 3, "Alabama"; 4, "Indiana."

Second Squadron—1, "Brooklyn"; 2, "Olympia"; 3, "Montgomery"; 4, "Mayflower."

First Reserve Squadron—1, "Panther"; 2, "Supply"; 3, "Nina"; 4, "Leyden."

Second Reserve Squadron—1, "Puritan"; 2, "Aileen"; 3, "Peoria"; Scouts—"Gloucester" and "Scorpion." The "Nina" and "Leyden" to act as tenders, and not a part of the force designated for the manœuvres.

After dark on the 31st August the "Supply," "Gloucester" and "Lebanon" (collier) were despatched to Block Island to anchor off the entrance to Great Salt Pond and to await the arrival of the Fleet. At 10.40 the same night, the Fleet got under way and headed to the westward. The "Olympia" was detached shortly after getting under way. The "Olympia" landed one company of Naval Reserves, in charge of Lieutenant Goodrich, M.V.M., at Gay Head, and occupied the signal station there; finding the station established by the Army a couple of days previously abandoned; then proceeded to Wood's Hole and cut all the cables connecting Martha's Vineyard with the mainland; sending telegrams to General MacArthur that this had been done. The cables were actually grappled, hauled up on the bows of a launch and all tools at hand to cut cables, all this to the satisfaction of the Umpire.

The Fleet arrived off west side of Block Island at early daylight on the morning of 1st September. The "Brooklyn," "Massachusetts," "Indiana" and "Puritan," shelled Beacon Hill with secondary batteries. The "Alabama" landed two companies of bluejackets, who advanced on Beacon Hill by two routes and captured it. There were a sergeant and four men in charge of the station, with no supports. The Army observer on board the "Alabama" acceded to the capture with no protest. The marines from the "Kearsarge," "Alabama," "Massachusetts," "Brooklyn," and "Olympia" were landed, and established a camp under command of Captain Magill, Fleet Marine Officer. The Fleet anchored, and preparations were made for further operations; the small vessels and collier inside Great Salt Pond.

The "Scorpion" was despatched at 10 a.m., 2nd September, to reconnoitre the channel around south end of Gardiner's Island. The "Scorpion" returned before dark, reporting that she had run on an obstruction, and was placed out of action for repairs by the ruling of the Umpire. The obstruction was a barge, 200 feet long, 10 feet deep, loaded with stone.

After dark, on 1st September, a Scouting Squadon, under the command of Commander Wilson, of the "Panther," with the "Supply," "Montgomery," and "Mayflower," got under way and scouted the enemy's coast from Price's Neck, Newport, to Fisher's Island. This squadron located the search-lights along this part of the coast, and drew

the fire of the forts at Newport while off Brenton's Reef Lightship. They returned and anchored off Block Island about daylight.

The "Brooklyn" and "Massachusetts" left the Base about 10 p.m., 1st September, to run through the Race, Gull Island passage, and take Fort Terry, on Plum Island, in reverse. The battle-ships, "Kearsarge," "Alabama," "Indiana," and monitor "Puritan" got under way at 1.40 a.m., 2nd September, and advanced to attack Fort Gardiner and Fort Terry from the south. Both fleets were in position by daylight, the fort on Gardiner's Island was put out of action by points, and a cross fire established on Plum Island. It is thought from this action that Plum Island was captured, and the fort on Great Gull Island by position, the Fleet being in its rear where none of its guns would bear.

A force composed of the "Brooklyn," "Olympia," "Puritan," "Montgomery," "Mayflower," "Peoria," "Aileen," and "Gloucester," under the command of Rear-Admiral Coghlan, was despatched the 2nd instant, for an attack upon Fort Rodman, New Bedford. This attack was carried out the following day, the vessels returning to the base that night, except the "Brooklyn" and "Peoria." The "Olympia" had picked up the company of Massachusetts Naval Militia before this attack. The "Brooklyn," in withdrawing from the action, struck an uncharted obstruction which dented her bottom slightly, and delayed her return until the following day looking for the obstruction. The damage was not serious, and she continued with the Fleet until the close of the manœuvres.

The morning of the 2nd, the "Leyden" surveyed a channel with 18 feet of water around the obstruction in the channel to the southward of Gardiner's Island, and joined the Fleet off Cerberus Shoal.

At daylight on the morning of the 3rd, the "Kearsarge," "Alabama," "Massachusetts," and "Indiana" bombarded Fort Wright for about two hours, then withdrew and anchored at the base. The ships steamed close along the south face of the fort, then doubled around Race Point, taking the batteries in reverse, returning by the same course.

On the morning of the 4th, about 4 o'clock, the "Kearsarge," "Alabama," and "Massachusetts" got under way and stood for the Race, intending to run through, as the weather was thick, but it cleared and they stood off to the northward and eastward toward Newport, then back to the base, where the "Indiana" joined them, and they kept under way the rest of the day, the "Indiana" anchoring before dark. After dark, the "Brooklyn" and "Olympia" leading, with three battle-ships, "Kearsarge," "Alabama," and "Massachusetts," about a mile behind, ran by the forts at the Race. The "Brooklyn" and "Olympia"

directed their fire to put out the search-lights; also, to draw the beams of the search-lights to them, and allow the battle-ships to get as close as possible before being discovered. The night was very clear and not the one that would be selected for such an undertaking, but the ruse was fairly successful, and the battle-ships got within close range before they were discovered. The ships anchored about half-past 1 on the morning of the 5th off Horton's Point, Long Island, and got under way again at 5 o'clock, proceeding to a place off Newport, outside of the range of the guns.

The afternoon of the 4th, an expedition under the command of Commander Wilson, of the "Panther," with the "Supply" and "Scorpion," proceeded to Fort Pond Bay, Long Island, cleared the beach by shelling, landed the battalions, captured a force of 130 and some signal stations, and held the place until ordered to withdraw, the afternoon of the 5th. The "Scorpion" rejoined the Fleet.

The forenoon of the 5th, the vessels rendezvoused off Newport for a bombardment. The plan of the attack was to anchor the "Massachusetts," "Indiana," and "Puritan," off Ochre Point and shell Forts Adams and Wetherill over the land, enfilading Wetherill, and taking Fort Adams in reverse. The "Montgomery," "Mayflower," and "Scorpion" attacked a signal and observation station at Price's Neck. The Umpire allowed that this was put out of action, but the boats' crews sent ashore to capture the place were ruled out as captured or killed. The "Brooklyn" and "Olympia" attacked the station near Narragansett Pier, which the Umpire allowed was out of action after twenty minutes' shelling with the secondary batteries. The "Kearsarge" and "Alabama" bombarded Forts Adams and Wetherill by zigzagging in the dead angle, of direct gun-fire, of Adams, Wetherill, and Greble; the intention being to pass inside and to the eastward of Brenton's Reef Lightship before turning out. It was not considered advisable to risk the ships for the purposes of manœuvres inside the Lightship, where uncharted rocks might be run upon.

The night of the 4th, Lieutenant S. S. Robinson and Lieutenant C. F. Hughes with the "Peoria" and a sailing launch cleared the channels at Newport by dragging and countermining. With the "Peoria" they dragged half-way across the western channel before being discovered and fired upon, and they continued to drag completely across under the fire. Then they planted countermines with buoys to mark the line of the mines in the eastern channel, and exploded them, then anchored inside until the next morning. They were under the beams of the search-lights while countermining, but were not fired upon. The next morning, under a flag of truce, they removed

the mines and buoys, being dangerous to navigation, and found that all the fuses of the mines had operated.

The night of the 5th instant, the "Brooklyn," "Olympia," "Kearsarge," "Alabama," "Massachusetts," in this order, formed to run the batteries at Newport through the eastern channel. (The "Montgomery" sailed for New York, the other ships proceeded to the base.) The ships started ahead about 9 o'clock in the evening, and ran by the batteries, finding no difficulty in navigating in spite of the glare of seven or eight search-lights directed upon them at once. (The guns were not fired, except by the rear vessels, as the smoke might have caused serious accident.) The vessels turned around Gould Island and went to sea, returning to the base and anchored.

The morning of the 6th the whole fleet, with the exception of the "Montgomery," was at anchor at the base, Block Island, R.I. The "Kearsarge," "Alabama," and "Massachusetts" passed in review before the forts at the eastern end of Long Island Sound, returning to Block Island, and the manœuvres were completed.

FRANCIS J. HIGGINSON, Rear-Admiral,

Commander-in-Chief, U.S. Naval Force, N. A. Station."

It is needless to say that, in the opinion of the Defence, the ships on each occasion, if not actually sunk by the fire from the forts, at least must have been so damaged as to be put out of action. It is claimed that during the night attack the Fleet was sighted at a range of about 6,000 yards, and at this distance the concentrated search-lights disclosed the attacking force perfectly, and that they were kept for far longer under the fire of the forts than according to the rules it was necessary to keep them to consider them destroyed; and it is further claimed that if not destroyed by the artillery fire, the ships must have been blown up by the submarine mines laid down, of the position of which the attacking force knew nothing, these mines being fired by electricity as soon as the range-finder showed that the ships were over them. The report of the Umpires, which has not yet been issued, will be awaited with much interest.

The following comments are made by an expert in the *Army and Navy Journal*:—

Some Notes from the Manœuvres.—It does not require a report from the Arbitrators to justify us in according unstinted praise to Rear-Admiral Higginson, his officers and men, for the admirable manner in which they handled their ships during the joint manœuvres. In thoroughness of organisation, and completeness of preparation, the Navy undoubtedly had

the advantage of the Army. In the number of men and guns the fleet outclassed the forts. The total guns afloat were as follows:—

Vessels.	13-inch.	12-inch.	8-inch.	6-inch.	5-inch.	3-inch	P's.
Massachusetts	0	4	8	4	0	2	8
Kearsarge	0	4	4	0	14	2	8
Alabama	0	4	0	14	0	2	6
Brooklyn	0	0	8	0	12	0	16
Olympia	0	0	4	0	10	0	21
Totals	0	12	24	18	36	6	59

The Navy insist that they won in the attack on Fisher's Island, Fort Wright. The attack was undoubtedly conducted with great skill and enterprise and the Navy had the guidance of numerous salient points on the island, flagstaffs, buildings, stacks, towers, etc., and the smoke from batteries. The Navy are very critical upon the management of the search-lights in the fortifications with the exception of those at Newport. The lights were swung too high, moved too rapidly, and were permitted to cross each other, which creates dead angles. The Navy are much more skilled in their use, having had more experience with them.

The ships fired very deliberately, expending less than one-half the allowance of ammunition for an actual engagement.

It is always to be remembered that the forts at the entrance to Long Island are in a very incomplete state and their defensive power can be, and should be, increased fourfold. The Race, through which the Navy claim to have forced a passage, is that portion of the Sound flowing between Fisher's Island, guarded by Fort H. G. Wright on the north, and Gull Island, guarded by Fort Michie on the south. Being the main outlet from the Sound, the channel is deep and the current swift, making mining difficult or impossible.

It is found that the Army 10-inch guns can fire ten shots in 8·4 minutes and the 6, three and one-half shots a minute. Some officers, among them Colonel Livermore of the engineers, believe the heavy guns can be brought to a speed of four shots in a minute by the use of springs to bring the ammunition into place, but springs are an uncertain dependence. These war experiences have also demonstrated the need of a surer friction primer for the Artillery and a more certain method of determining ranges.

There were some curious effects of the operation of gas in the mortar pits recorded. One of the men had his hair burnt off by the sweeping of a current of gas through the pit.

Some method should be found for keeping magazines dry. When the doors are opened, and the current of air of a different temperature sweeps in, the moisture congeals upon the wall and trickles down the

side. The telephones in our forts need to be protected from the effects of gun fire and their service improved by the selection of the best men for telephone work.

The experiences of last week were a triumph for the depressing gun carriages and General Crozier, who was present at the manœuvres, witnessed with justifiable pride the results of his labours.

The Navy are by no means prepared to admit that their vessels were sunk by torpedoes, and they express as much contempt for them as Admiral Farragut did after his experience with them in Mobile bay. They do not believe that they run any risk, except possibly from mines exploded by actual contact. As to the supposititious obstructions in the channel ways, they declare that it would have been impossible to get them there in the time allowed the Army engineers, except on paper. They are not prepared to admit the claims of the Army as to the percentage of hits from their guns, realising from their experience that, even if the small percentage of shots that could be planted on the sides of a battle-ship struck, very few would do any injury against her armoured sides; nor do they either admit the Army claims as to the effectiveness of mortar firing, while they claim credit for the manner in which they carried their ships behind the forts where they could get an enfilading fire upon them from a perfectly safe position. For the fire-control stations they recommend monitor turrets. They consider the electrical appliances of the fortifications a most uncertain reliance, and have more confidence in their system of men behind the guns, in constant touch with them and taking their chances with them instead of depending so largely, as the Army do, on mechanical appliances to guide their firing. On the whole, the Navy have derived increased confidence from their experience in the manœuvres, and believe that they have rendered an important service to the Army and to the country by revealing some of the weak points in our system of coast defence.

A court of inquiry will be ordered to determine the facts as to the grounding of the "Brooklyn" during the manœuvres. It was obviously an accident that could not have been avoided. There could be no lack of care and vigilance on a ship commanded by so able and accomplished an officer as Captain Todd. He was thoroughly alive to the risks he ran in feeling his way through a channel not sufficiently charted, but his orders were imperative. Carrying heavy battle-ships through channels where merchant-ships require a pilot was a severe test of the ability of our Navy officers, and the admirable manner in which their ships were handled will be better understood when it is realised that Admiral Higginson's fleet were subjected, to a large extent, to the actual risks of war, running through the narrow channels without pilots, and oftentimes

at night, hugging the shore to get into the dead angles where they were safe from the fire of the forts.

However much opinion may be divided as to the result in real war of Admiral Higginson's night attack on the 5th, it was undoubtedly a dashing performance. His five ships, which were handled with great skill, and what would have been in war the utmost daring, ran through the narrow channel between Forts Adams and Wetherill at full speed, firing broadsides from both port and starboard batteries, main and secondary, and playing their search-lights on the forts. Admiral Coghlan led with his flag-ship, the "Brooklyn," followed by the "Olympia," "Kearsarge," "Alabama," and "Massachusetts." Fire was opened on them from the forts at 3,900 yards, but, in the words of an eye-witness:—"They disappeared out of the rays of a dozen search-lights seeking them, and at 11.30 o'clock, as if conscious that no further harm could befall them, they slowly passed out between the defeated forts and disappeared at sea. The entire fight lasted not more than twenty minutes, and in boldness of conception and brilliancy of execution was the finest thing yet done by the invader, and was a fitting blaze of glory in which to end the great war game." At midnight communication was had with Army headquarters by telephone. Their comment on the fight was: "We sank them all. It will take a year to raise them." Fort Adams, it was said, fired forty-eight salvos from its mortar batteries. The figures from Fort Wetherill had not been received.

Previous to the attack upon Newport a plan for clearing out some of the mines in the harbour and countermining others was devised by Lieutenants Robinson of the "Alabama," and Hughes of the "Massachusetts," under orders from Admiral Higginson. The skilful execution of this plan is regarded by the Navy as one of the chief features of the manœuvres, being a successful attempt to countermine a channel. Dutch Island Channel was first dragged for the main cable, two beam trawls being used, each trawl having three grapnels attached. In the main channel was then planted, 200 feet apart, eight countermines containing live detonators. One trawl was lost in getting it on board, but the other, with 100-lb. grapnels, came on board. The grapnels were polished bright and showed that if there had been a mine cable there it would have been caught and brought to the surface or broken. The expedition was picked up by the Dutch Island search-lights at midnight but they did not make out its character, for no guns were fired.

Both Rear-Admiral Higginson and Major-General MacArthur expressed themselves as extremely pleased with the zeal and spirit displayed by the officers and men under their respective command, and the intelligent interest all ranks displayed, which made the manœuvres exceedingly inspiring and instructive. Major-General MacArthur also bore testimony

to the feeling of admiration the land forces entertained for the splendid manner in which the naval part of the programme was conducted.

Commenting on the operations, Rear-Admiral Higginson stated:— "I regard the manœuvres of the week as being most beneficial to the Navy. We have been taught to know what to do under conditions of war, and our experience has been of almost incalculable value. In my opinion, these manœuvres should be held every summer. The presence of the naval militia added much to the interest of the occasion, and the services of these men have been very satisfactory."

GENERAL WOLFE'S ADVICE TO A NEWLY-JOINED ENSIGN IN 1756.

Contributed by CHARLES DALTON, Esq.
(*Editor of "English Army Lists and Commission Registers, 1661-1714."*)

WOLFE'S letters, like his personal belongings,[1] are greatly prized by their fortunate possessors. Fifty odd years ago literary circles in Glasgow were agreeably surprised by the accidental discovery, in their own city, of a batch of twelve very interesting letters from Wolfe to his bosom friend, Captain (afterwards Lieut.-Colonel) Wm. Rickson; also the first half of an unaddressed letter from Wolfe (then Lieut.-Colonel of the 20th Foot) to a young ensign. The late Dr. John Buchanan, LL.D., an eminent Glasgow antiquarian and historian, who edited and annotated Wolfe's letters to Rickson (which began in 1749 and ended in 1758), as well as the before-mentioned half letter, in a local work entitled "Glasgow Past and Present," describes in his chapter on Wolfe how these same letters were found. He says:—

"It happened that an elderly gentleman died a few years ago, in whose possession an antique military chest had remained more than half a century, uncared for. It was known to have been the property of a relative long since dead—a colonel—but supposed to contain only useless papers. The key had been broken in the rusty lock, and thus the contents were fortunately preserved from dispersion and loss. After the gentleman's death the chest was broken open by his representatives and found to be filled with antique military reports and papers, besides bundles of old letters. In a corner, carefully tied up by themselves, a group of letters was discovered bearing the signature 'James Wolfe.'"

Wolfe's twelve letters to Rickson were presented by their owner (Mrs. Robertson, great-niece to Lieut.-Colonel Rickson's widow) to the Museum of Scottish Antiquities, Edinburgh; but the half letter from Wolfe to a young ensign remained in Dr. Buchanan's possession and was recently bought, along with some of Colonel Rickson's papers, by the

[1] Wolfe's sword is preserved at the Royal United Service Museum, Whitehall; his cloak is at the Tower of London; his spurs were formerly in possession of a Glasgow gentleman, but now, unfortunately, lost; while his sash, stained with his blood, is, or was, in possession of a Scottish family named Stirling. And the little book on fortifications (John Barker's) found in Wolfe's pocket after his death, on the fly-leaf of which work the hero of Quebec had written "This is a very good book," is in the Royal Artillery Institution Library.

present writer from a well-known Edinburgh autograph dealer. "In order," wrote Dr. Buchanan on the sheet of paper in which this precious fragmentary letter is enclosed, "to test the handwriting to be that of Wolfe, the fragment was sent by me to Robert Wright, Esq., 102, Great Russell Street, Bloomsbury, London, author of a Life of Wolfe, now in course of being published, that he might compare it with the numerous letters to Wolfe in his possession. This I did on 17th June, 1863, and after a careful comparison he wrote me on 7th July following:—'At the first glance I was satisfied that the handwriting is Wolfe's and none other; and after having compared it with Wolfe's original letters at Squerries, there remains no doubt whatever on my mind that Wolfe wrote the letter to *Dear Huty*.'"

The letter in question was pronounced by Wolfe's biographer to have been written to Ensign Hugh Lord, nephew to Lieut.-Colonel Rickson, who was appointed ensign in the 2nd Battalion of Lord Charles Hay's Regiment (33rd Foot), 1st September, 1756. The letter is as follows:—

"Dear Huty,—By a letter from my mother I find you are now an officer in Lord Chs. Hay's Regiment, which I heartily give you joy of, and, as I sincerely wish you success in life, you will give me leave to give you a few hints which may be of use to you in it. The field you are going into is quite new to you, but may be trod very safely, and soon made known to you, if you only get into it by the proper entrance.

"I make no doubt, but you have entirely laid aside the boy and all boyish amusements, and have considered yourself as a young man going into a manly profession, where you must be answerable for your own conduct; your character in life must be that of a soldier and a gentleman; the first is to be acquired by application and attendance on your duty; the second by adhering most strictly to the dictates of honour, and the rules of good breeding; to be most particular in each of these points, when you join your Regiment; if there are any officers' guard mounted, be sure constantly to attend the parade, observe carefully the manner of the officers taking their posts, the exercise of their espontoon, etc.; when the guard is marched off from the parade, attend it to the place of relief, and observe the manner and form of relieving, and when you return to your chamber (which should be as soon as you could, lest what you saw slip out of your memory), consult Bland's military discipline[1] on that head; this will be the readiest method of learning this part of your duty, which is what you will be the soonest called on to perform.

"When off duty get a serjt or corporal, whom the adjutant will recommend to you, to teach you the exercise of the firelock, which I beg

[1] "A Treatise on Military Discipline," by Humphrey Bland, Esq., Brigadier-General of His Majesty's Forces. London, 1743.

of you to make yourself as much master of as if you were a simple soldier, the exact and nice knowledge of this will readily bring you to understand all other parts of your duty, make you a proper judge of the performance of the men, and qualify you for the post of an adjutant, and in time many other employments of credit.

"When you are posted to your company, take care that the serjeants or corporals constantly bring you the orders; treat those officers with kindness, but keep them at a distance, so will you be beloved and respected by them. Read your orders with attention, and if anything in particular concerns yourself put it down in your memorandum book,

which I would have you [keep] constantly in your pocket ready for any remarks. Be sure to attend constantly morning and evening the roll calling of the company; watch carefully the absentees, and enquire into reasons for their being so; and particularly be watchful they do not endeavour to impose on you sham excuses, which they are apt to do with young officers, but will be deterred from it by a proper severity in detecting them."

Here, unfortunately, the rest of this excellent letter has been torn off.

The water-mark on the paper of the above half letter is identical with Wolfe's letters to Rickson,[1] viz., the motto "PRO PATRIA," under

[1] Article on Wolfe's letters by Dr. Buchanan in "Glasgow Past and Present."

which is a lion rampant, crowned, brandishing in his dexter paw a knife, while his sinister paw grasps a bundle of fascines (?) To the right of the lion is the figure of Britannia, seated, holding in her dexter hand a large battle-axe (?) The above figures are enclosed by a wooden stockade. This remarkable heraldic device appears to have been a Government water-mark on the paper issued to the British Army from 1749-1759. There is still preserved at the British Museum[1] a letter from that great commander, Prince Ferdinand of Brunswick, to the Duke of Newcastle, 4th September, 1759, which bears the self-same water-mark.

Hugh Lord, Wolfe's *protégé*, had a very creditable military career. He was promoted lieutenant 8th May, 1758, and the same month his battalion became the 72nd Foot, the command of which was given to the young Duke of Richmond. Lord served with the last-named corps on an expedition to the French coast, and was at the siege and capture of Havanna in 1762. In January, 1763, he purchased his captaincy in the 72nd, and on this regiment being disbanded in the autumn of 1763 was placed on half pay. It may be taken for granted that Hugh Lord was considered a good officer, as he was appointed major of the 75th (Prince of Wales's) Regiment of Foot, 30th May, 1778, which was a few months after the said corps was raised. It may be mentioned that one of Major Lord's brother officers was Captain Thomas Picton—afterwards the celebrated infantry general who commanded the "Fighting" Third Division in the Peninsular War and fell at Waterloo—who, like Lord, was a native of Pembrokeshire. The 75th were disbanded in 1783, and Major Lord again found himself on half pay. But on 19th March, 1801, Hugh Lord was given the command of one of the eleven Companies of Invalids in Jersey. These companies were reduced before 1808, and, in recognition of his meritorious service, Hugh Lord was allowed to retire on full pay as major. He died 2nd June, 1829, having attained the age of 88.

[1] Add. MS. 32,895, folio 160.

NAVAL NOTES.

HOME. - The following are the principal appointments which have been made: Captains—C. E. Madden to "Good Hope"; C. H. Cochran, M.V.O., to "Australia": F. O. Pike to "Camperdown"; Sir R. Poore, Bart., to "Jupiter"; H. S. Niblett to command of Royal Naval Barracks, Devonport; P. F. Tillard to "Canopus"; L. E. Wintz to "Pembroke"; J. C. Wilkinson to "Thetis"; G. E. Patey to "Venerable"; F. E. Brock to "Bacchante"; R. S. Lowry to command of Engineering College, Keyham.

The first-class battle-ship "Renown," which is conveying H.R.H. the Duke of Connaught to India, embarked the Duke and Duchess at Genoa on the 30th ult., leaving the same evening for Port Said, where she arrived on the morning of the 6th inst.: she is to leave Suez with their Royal Highnesses in continuation of their voyage on the 16th inst. The new first-class battle-ship "Venerable," commissioned at Chatham on the 12th ult., as flag-ship of Rear-Admiral Custance, C.M.G., the new second-in-command in the Mediterranean, and left, flying that officer's flag, on the 26th ult. for her station. The second-class cruiser "Thetis" commissioned on the 26th ult. at Devonport for the Pacific, where she will relieve the "Arethusa," temporarily attached to the China station. The first-class cruiser "St. George," late flag-ship of the Cruiser Squadron, paid off on the 15th ult. at Portsmouth. The new first-class armoured cruiser "Hogue" commissioned at Devonport on the 19th ult. for service with the Channel Squadron, where she takes the place of the "Niobe." The second-class cruiser "Flora" commissioned on the 11th ult. for the Pacific, had left on the 26th ult. for her station, where she relieves the "Phaeton." The first-class battle-ship "Hood" paid off on the 5th inst. at Devonport, and the third-class cruiser "Barham" at Portsmouth on the following day, both from the Mediterranean.

The "Good Hope."—The first-class armoured cruiser "Good Hope," flying the flag of Rear-Admiral W. H. Fawkes, C.V.O., left Portsmouth *en route* to the Cape at 3.15 p.m. on the 25th ult., with the Colonial Secretary on board; she passed Gibraltar at 4 p.m. on the 28th, and Malta at 11 p.m. on the 1st inst., arriving at Port Said at 8 a.m. on the 4th inst.; after coaling at Suez the cruiser left in continuation of her voyage at daybreak on the 8th inst. Heavy weather was experienced down Channel and while crossing the Bay, the ship proving herself rather wet, the sponsons and ash-shoots projecting from the ship's side catching the water and throwing drenching showers of spray all over the ship. On the afternoon of the 30th the starboard engine had to be stopped, and it was found that the brasses of the intermediate crank had run out, and required replacing. The work was carried out by the engine-room staff in about thirty hours, during which time the ship proceeded with her port engine alone, at a speed of about 12 knots. Later the port engine had to be stopped for a couple of hours, for the adjustment of the intermediate crank brasses. In consequence of these mishaps the ship arrived nearly a day late at Port Said; while the average speed between Portsmouth and Port Said appears to have been only 14·7 knots.

Steam Trials.—The new sloop "Merlin" has completed her trials successfully. At the 30 hours' coal-consumption trial at 3-14ths of her *maximum* power, the results were as follows:—Draught of water, forward 10 feet 11½ inches, aft 11 feet 6 inches; pressure of steam at boilers, 186 lbs.; ditto at engines, 175 lbs.; vacuum, starboard 27·1 inches, port 27·3 inches; revolutions, starboard 119·5 per minute, port 118·9; mean pressure in cylinders, starboard high 35·4, intermediate 16·5, low 4·8; port high 38·3, intermediate 13·3, low 5·4; I.H.P., starboard high 53, intermediate 61, low 48—total 162; port high 57, intermediate 56, low 54—total 167; aggregate I.H.P., starboard and port 329; coal consumption, 1·81 lbs. per I.H.P. per hour; speed, 8·8 knots.

At the 30 hours' run at 5-7ths of the *maximum* horse-power the results obtained were:—Pressure of steam at boilers, 220 lbs.; ditto at engines, 212 lbs.; vacuum, starboard 27·2 inches, port 27·5 inches; revolutions, starboard 180, port 178 per minute; mean pressure in cylinders, starboard high 67, intermediate 31·2, low 12·3, port high 75·2, intermediate 31·4 low 12·2; I.H.P., starboard high 156, intermediate 174, low 179—total 509; port high 169, intermediate 174, low 181—total 524; aggregate starboard and port, 1,033-I.H.P.; coal consumption 1·69 lbs. per I.H.P. per hour; speed, 13·5 knots.

At the 8 hours' full-power trial the following results were obtained:—Pressure of steam at boilers, 218 lbs.; ditto at engines, 205; vacuum, starboard 26·8 inches, port 26·6 inches; revolutions, starboard 198, port 198; mean pressure in cylinders, starboard high 87·6, intermediate 41·3, low 15·7, port high 96·7, intermediate 37·5, low 15·8; I.H.P., starboard high 219, intermediate 253, low 258, port high 241, intermediate 229, low 260—total starboard and port, 1,460 per I.H.P.; coal consumption per I.H.P. per hour, 1·64 lbs.; speed, 13·43 knots.

The first-class torpedo-gunboat "Gossamer," which has been fitted with new engines and a set of Reed's water-tube boilers at Palmer's Works, Jarrow-on-Tyne, has completed satisfactorily a 3 hours' full-power trial, the engines developing 6,256-I.H.P., or 256-I.H.P. in excess of the contract. The former machinery only developed 2,500-I.H.P. The results were as follows:—Pressure of steam at boilers, 229 lbs.; ditto at engines, 221 lbs.; vacuum, starboard 25 inches, port 26 inches; revolutions, starboard 383, port 383 per minute: mean pressure in cylinders, starboard high 99, intermediate 45·4, low 18·2, port high 94·9, intermediate 45·8, low 19·5; I.H.P., starboard high 980, intermediate 1,075, low 1,052—total 3,107; port high 942, intermediate 1,087, low 1,120—total 3,149; aggregate of starboard and port 6,256-I.H.P. The speed and coal consumption were not taken.

The New Destroyers.—The 19 torpedo-boat destroyers now building are to be fitted with small tube water-tube boilers of the following types:—Five boats building at the yard of Messrs. Palmer, Jarrow-on-Tyne, the "Exe," "Ettrick," "Erne," "Cherwell," and "Dee," with Reed boilers. Four boats building at the yard of Messrs. Jarrow, Poplar, the "Ribble," "Usk," "Teviot," and "Welland," with Yarrow boilers. Four boats building at the yard of Messrs. Laird, Birkenhead, the "Itchen," "Foyle," "Arun," and "Blackwater," with Laird-Normand boilers. Three boats building at the yard of Messrs. Hawthorne, Leslie, & Co., Newcastle, the "Derwent," "Eden," and "Waveney," with modified Yarrow boilers. Two boats building at the yard of Messrs. Thornycroft, Chiswick, the "Kennet" and "Jed," with Thornycroft boilers. One boat building at the yard of the Parsons Steam Turbine Company, the "Velox," with modified Yarrow boilers. Nine torpedo-boats are in course of construction, and of these five, building at the yard of Messrs. Thornycroft, Chiswick, will be fitted with Thornycroft boilers; four building at the yard of Messrs. White, of Cowes, will be fitted with White-Forster boilers. Two third-class cruisers are in hand; one, the "Amethyst," building at

Elswick, is to have her machinery fitted by the Parsons Turbine Company, and with modified Yarrow boilers; the other, the "Topaze," is building at Birkenhead and will be fitted with boilers of the Laird-Normand type.

The New Bermuda Floating Dock.—The new dock arrived safely at its destination last August, but want of space has up to the present prevented us from giving any details of this great structure.

The dock was launched last February from the yard of Messrs. C. S. Swan and Hunter of Wallsend-on-Tyne. The structure is 545 feet long, and the side walls are 53 feet 3 inches high. The general shape in cross section is that of a letter U, but on the outside the rounded bottom—the bilge part, as one would say, of a ship—is square, so that the exterior outline is rectangular like a barge. The width between the walls is 100 feet clear, and, as the walls themselves are over 13 feet across, the total width of the structure must be about 130 feet. The dock is capable of lifting out of the water a ship of 17,500 tons in weight and drawing 32 feet of water. As it has no end gates it will take ships of the greatest length within its lifting capacity as to weight. Its first duty is to lift line-of-battle ships of the first class of about 400 feet long and 15,000 tons displacement, which will have a bearing length on the keel blocks of 343 feet. The docking of first-class cruisers, such as the "Powerful" and the "Terrible," will be a hardly less important task. These ships, though 100 feet longer, are of somewhat less displacement, but will have a bearing length of 383 feet. Mercantile cruisers might in time of war also have to be lifted. These ships, being of greater length and having straighter keels, give a longer bearing line: the "Campania" for instance—600 feet long and 17,000 tons displacement—has a bearing length of keel of 502 feet. These conditions render it necessary that the strength of the dock should be very great, and this has been secured by the method of structure. It has, however, to be, like the original Bermuda dock, a self-lifting structure—that is to say, it can take itself to pieces and lift any one part for the purpose of cleaning or repair. This is a more necessary condition in a hot climate, where the growth of marine fauna is vigorous.

The dock consists of five chief parts. They comprise three pontoons, which form the main lifting portion of the dock. There are also two side walls, which are chiefly designed to afford stability, although they afford a certain amount of lifting power. The centre pontoon is 300 feet long, and is rectangular in shape, whilst the two end pontoons, which may be described as the bow and stern, have a length of 120 feet, of which a portion was so shaped to afford a somewhat bluff bow, which much facilitated the work of towing her across the Atlantic. What are known as the altars of a graving dock are formed in the side walls so as to facilitate shoring-up when a ship is docked. For docking armour-clad ships special provision has been made for supporting the belt by working in a strong channel to take the heels of that vertical shores. The side walls have in them two large openings by which light and air are more readily admitted to the bottom of the dock. The pontoons are divided into forty chambers, and the side walls have sixteen divisions in all. Each of these divisions has its separate suction pipe leading to the pumping machinery by which it can be emptied. Very complete provision is made for rendering the pumping arrangements interchangeable. There are four 18-inch centrifugal pumps placed in each wall, together with their motive machinery and boilers for generating steam. The working of the whole of the arrangements is carried on from a central position at the top of each tower. There are the usual warping bollards, capstans, fair-leads, etc.; as well as an electric light installation. There are also travelling and

swinging electric cranes, which are driven by a separate electric machinery. Both the lighting and lifting installations are, however, interchangeable.

The dock is taking the place of the existing structure of the same kind now at Bermuda. The first Bermuda dock was taken out in 1869, and has now become obsolete, not through decay, but because ships have increased in weight and dimensions. The original structure was 381 feet over all and 84 feet between the side walls, and would lift a ship of 10,200 tons. When it became evident that a new dock must be made for the port the Admiralty tried everything possible to get an ordinary graving dock made. Borings were made at every available place on the island, but the geological formation proved unsuitable for the purpose. They had, therefore, to fall back on a floating structure, which, though possibly the cheaper of the two, was not considered by the authorities so desirable for naval purposes from some points of view. The price of the dock has been stated to be £230,000, of which £35,000 will represent the cost of transportation from the Tyne to Bermuda. The dock was first towed round to Sheerness, where it was thoroughly tested, the "Sans Pareil" being successfully docked in it. It left Sheerness on the 16th June for Bermuda, in tow of two Dutch tugs, no English tugs being powerful enough for the work.—*Times, etc.*

FRANCE.—The following are the principal appointments which have been made: Rear-Admirals—J. J. Bugard to the Command of a Division of Cruisers in the Atlantic Fleet; A. V. A. Le Do, to the Command of a Division in the China Fleet. Capitaine de Vaisseau—A. J. C. Fouet to "Kléber."—*Journal Officiel de la République Française.*

Rear-Admiral Bugard is to succeed Rear-Admiral Gourdon in command of the Cruiser Division of the Northern Squadron, and he hoisted his flag at Brest, on the 30th ult., on board the first-class armoured cruiser "Bruix." It is reported that Rear-Admiral Gourdon is to succeed Rear-Admiral Marquis as Chief of the General Staff, the latter officer taking the place of the late Rear-Admiral Merleaux-Ponty, in command of the Algerian Naval Division. Rear-Admiral Le Do, who is to succeed Rear-Admiral Bayle, as second-in-command in China, will hoist his flag on board the first-class armoured cruiser "Montcalm," and proceed in her to the East; on arrival, the "Montcalm" will hoist the flag of Vice-Admiral Maréchal, the Commander-in-Chief, relieving the second-class battle-ship "Redoutable" as flag-ship, which ship is to be placed in reserve at Saigon; Rear-Admiral Le Do will, in his turn, transfer his flag to the new first-class cruiser "Châteaurenault," which left Toulon for China on the 20th ult., having at last succeeded in getting through her trials. The second-class cruiser "Friant" arrived at Cherbourg on the 28th ult. from China, and is to be paid off into the Reserve; she was the first ship of any size to be fitted with the Niclausse boilers, and during her three years' stay in China they have given no trouble. The second-class cruiser "Catinat" has left Madagascar for Lorient, where she will be paid off into the Second Category of the Reserve.

The Revised Estimates for 1903.—The credits asked for in the *Projet de Budget de la Marine for 1903* amount to 306,692,678 francs (£12,267,630), as against 306,798,738 francs (£12,271,949) for 1902; the difference, 106,060 francs, is not great, but there are, nevertheless, some important changes in the different votes. For instance, chapter 7, *Equipages de la Flotte*, shows a reduction in the effective strength of the personnel, as will be seen from the following table:—

	Number of Men.			
	On Shore.	At Sea.	Reserve.	Totals.
Effectives for 1902	5,565	37,252	5,435	48,252
„ „ 1903	5,300	33,667	6,345	45,312
Difference, increase	—	—	910	910
„ reduction	265	3,585	—	3,850
Reduction for 1903				2,940

These figures show that the reduction is chiefly concerned with the number of men at sea.

As regards new constructions, fewer ships appear to be built in the Government arsenals and more by contract.

The *Projet de Budget* is preceded by a note or explanatory statement by the Minister of Marine, in which he gives his reasons for retrenchment, stating that the financial situation demanded a reduction in the expenses so as not to exceed the total sum voted by the chamber. M. Pelletan has therefore stopped the work on the three battle-ships "Démocratie," "Vérité," and "Justice," which has been the subject of so much discussion, and by which a saving of 13,000,000 francs is effected. He contends that the commencement of these three vessels had not been regularly sanctioned by the Chamber, and that therefore he is justified in reducing the credits by this sum. This matter has, however, since been placed beyond dispute, the Chamber, by its vote on the 13th November, having expressed its wish that these battle-ships be proceeded with.

A saving in the Budget has also been effected by placing the crews of the Mediterranean Squadron on a reduced footing during the six winter months. M. Pelletan explains that this course has been practised with the Northern Squadron for some years without any inconvenience, and has been found by experience not to interfere with the training of the crews, the number of men being sufficient to take the ships to sea and up to a certain point to *faire acte de combat*. This phrase has been severely criticised, it being pointed out that though for economical reasons the reduction in the crews of the Northern Squadron may have been tolerated, it is nevertheless hardly safe for France for six months to be without *any* fleet capable of acting on the offensive, except up "to a certain point."

As bearing on the above, three cruisers belonging to the Mediterranean Squadron, the "Du Chayla," "Pothuau," and "Chanzy," received sudden orders to proceed to Morocco on 20th November, and were delayed 24 hours completing their crews. Had the whole squadron been ordered on service, the delay in assembling so much larger a number of men would probably have been a matter of days instead of hours.

Composition of the Squadrons.—According to the revised budget proposals the squadrons are now to be constituted as follows :—

In the Mediterranean, six battle-ships, which will be formed in two divisions.

First-class battle-ships—"Saint Louis," "Iéna," "Jauréguiberry," "Gaulois," "Charlemagne," "Bouvet," which is to be replaced by the "Suffren" when that ship is ready.

First-class armoured cruisers—"Amiral-Gueydon," "Chanzy," to be replaced by the new armoured cruiser "Sully" when ready, "Latouche-Tréville," to be replaced by the new armoured cruiser "Dupleix" when ready.
Second-class crusier—"Du Chayla."
Third-class cruisers—"Galilée," "Linois."
Destroyers—"Espingole," "Hallebarde," "Pique," "Épée," "Pertuisane," "Rapière."

The Reserve Division—
First-class battle-ships—"Brennus," "Carnot," "Charles Martel."
Destroyer—"La Hire."

The Squadron of the North, six battle-ships, or coast-defence ships, to be formed in two divisions.
First-class battle-ship—"Masséna."
Second-class battle-ship—"Dévastation," to be replaced by first-class battle-ships "Bouvet," "Henri IV."
Coast-defence battle-ships—"Bouvines," "Amiral-Tréhouart," "Valmy."
First-class armoured cruisers—"Jeanne d'Arc." "Marseillaise."
First-class protected cruiser—"Guichen."
Destroyers—"Fauconneau," "Yatagan," "Escopette," "Harpon," "Flamberge," "Carabine."

By the new arrangement, the Battle-ship Division of the Mediterranean Squadron remains unchanged, but the armoured Cruiser Division is strengthened by the substitution of two new ships for the now rather out-of-date "Chanzy" and "Latouche-Tréville"; on the other hand, the Reserve Squadron is weakened by two first-class battle-ships, which now go to strengthen the Northern Squadron, as they take the place of two much older and weaker vessels; the Cruiser Division of the Northern Squadron is also strengthened by the substitution of the "Guichen" for the "Tage," an older vessel. The Reserve Division of the Mediterranean is further weakened by the withdrawal of the second-class battle-ship "Hoche"; the two armoured cruisers "Pothuau" and "Amiral-Charner" and the third-class cruiser "Lavoisier"; presumably these ships are to be placed in the Second Category of the Reserve.

The new organisation of M. Lanessan, by which the Atlantic Division was merged into what was to be called the Atlantic Fleet, and the East Indian and Pacific Divisions similarly merged in the China Fleet, has also been reversed and the old organisation re-established.

Atlantic Division.
First-class cruiser—"Tage," to be replaced by the armoured cruiser "Désaix.'
Third-class cruisers—"Troude," "D'Estrées."

Pacific Division.
Second-class cruiser—"Protet."
Aviso-transports—"Meurthe," "Durance."
First-class gun-boat—"Zélée."

East Indian Division.
Third-class cruiser—"Infernet."
Aviso-transport—"Nièvre."
First-class gun-boat—"Capricorne."

China Squadron.

First-class armoured cruisers—"Montcalm," "Kléber."
First-class cruisers—"Châteaurenault," "Jurien de la Gravière."
Second-class cruisers—"Pascal," "Bugeaud."
Aviso-cruisers—"Alouette," "Bengali."
First-class gun-boats—"Surprise," "Décidée," "Comète."
River gun-boats—"Argus," "Olry," "Vigilante."

Cochin-China, Reserve Division.

Second-class battle-ship—"Redoutable."
Armoured gun-boats—"Styx," "Achéron."

Special Reserve.

Armoured cruiser—"Vauban."
Gun-boats—"Lion," "Vipère."

Capitaines de Frégate.—A decree has been published relative to the length of time capitaines de frégate are to be embarked. Those who are second in command retain their appointments for 18 months, and those on distant stations will be relieved after two years' service. Capitaines de frégate doing duty as second in command are to retain their appointments for the regulation period, even if the captain of the ship be changed.

Projectiles in the French Navy.—There are three principal kinds of shell used in the French Navy:—1. Armour-piercing shell. 2. Common shell. 3. Shrapnel. Armour-piercing shell should be fired at as close range as possible, as should it pierce at the water-line, the ship may have been dealt a fatal blow. In spite of the advance made in armour plating, it still seems probable that victory will remain with the gun, since the introduction of the steel cap for use with the projectiles. To attack successfully a cemented steel plate, a velocity of 35 per cent. greater than that necessary to pierce an ordinary steel plate is required; but by the use of the cap the velocity is reduced to 25 per cent. The ordinary shells are of two kinds, those in cast iron, and those of *semi-rupture* in steel. The first have a thickness of from one-fifth to one-sixth of their calibre. Those of a calibre of 4 inches or more are charged either with black powder or with melinite. Numerous experiments have been carried out on the hulls of old armoured war-ships, and notably the "La Galissonnière" at Cherbourg has been used as a target. The results have not yet been made public, either of the experiments at Cherbourg or of those previously carried out at Toulon and at Gavres; but they have sufficiently demonstrated the importance of light armour, of the development of a system of small compartments above the chief armour deck, and of the addition of protection against shell splinters. Whether charged with gunpowder or melinite, the shells do enormous damage, projecting splinters of shell and fragments of the armour plates into the interior of the vessel struck, setting alight, when charged with gunpowder, to anything inflammable, and when charged with melinite giving forth a deleterious gas. When fired at land fortifications the melinite shells were the more destructive of masonry, and the gunpowder shells of life. The shells of *semi-rupture*, though never used yet in war, have long been carried on board French ships. They have a cap or mantle of hard steel, which enables them to pierce armour of moderate thickness and then to burst in the rear of it. They are made in all calibres between 3·93 inches and 13·38 inches; they are longer than the cast-iron shells and their walls are from one-sixth to one-seventh of their calibre in thickness. Though their bursting charge is not so powerful as that of the iron shells of the same calibre, its force is all expended

on the interior of a vessel or fort, and the explosion, therefore, is far more destructive, especially when melinite is used. The 12-inch guns of the model 1893–6, with which the more recent French battle-ships are armed, will throw one of these shells with a muzzle velocity of 2,952 feet (900 metres) and pierce slightly more than 3¼ feet of iron at a distance of 546 yards (1 metre of iron at 500 metres), which, according to the writer of the article, is more than equal to the performance of American and English guns and shells. Shrapnel shells are not much used in the French Navy; but in some experiments carried out recently in the French Mediterranean Squadron it was found that the balls with which they are filled easily penetrate the plates of torpedo-boats, and send these boats quickly to the bottom.—*Le Temps* and *Le Yacht*.

French Naval Ordnance.—Since 1870 there have been introduced no fewer than 74 different types of gun, varying from 37-millimetre (1·45-inch) to 420-millimetre (16·53-inch). The difference is not only in calibre, for often guns of the same calibre differ from one another in other respects—some in length as measured in calibres, some in their large or small chamber, and some in being with and others without trunnions, according to the nature of the carriage. The different calibres are 16·53-inch, 14·56-inch, 13·38-inch, 12-inch, 10·8-inch, 9·45-inch, and 7·48-inch among the large guns; 6·48-inch, 5·45-inch, and 3·93-inch among the medium artillery; and 3·54-inch, 2·56-inch, 1·85-inch, and 1·45-inch, which are classed as small guns—in all, 14 different calibres. Then there are 45 different charges, not counting those of exercise and salute, and 128 different projectiles. The 5·45-inch guns alone are of 10 types, with 5 different charges and 17 different projectiles. There are also numerous kinds of carriages adapted to different methods of mounting and to various ways of dealing with the recoil. These differences cause endless confusion even in peace-time. The "Brennus," for instance, had carriages for her 6·48-inch guns placed in the casemates, but when the guns arrived it was found that they could only be mounted on other carriages specially designed for them. From 1870 to 1875 the guns were cast, but furnished with steel tubes; it was then possible to use coarse-grained black powder, as the resistance of the gun was increased. At the same time the barrels were lengthened from 18 to 22 calibres; the charges, and with them the chambers, were enlarged, the charges being then 28 per cent. of the weight of the projectiles, giving these a muzzle velocity of 1,640 feet per second. In 1875 the guns were made entirely of steel. Later the use of brown prismatic powders permitted the further increase of the charges and gave rise to guns known as 75 modified. The length of gun reached 28·5 calibres in 1879; and the 14·56-inch guns had a charge of 36 per cent. of the weight of the projectile, which had a muzzle velocity of 1,968 feet per second. The invention of powder B in 1883 permitted the charges to be reduced. The guns, which had increased in length to 30 calibres in 1884, reached 45 calibres in 1887; the powder chamber was nearly doubled in size though the weight of the charge was only 31 per cent. of that of the projectile, which had a muzzle velocity of 2,625 feet per second, and this was increased by the year 1896 to 3,035 feet. This progression has brought about the differences which are deplored. The writer concludes by advocating the use of not more than six different calibres throughout the French Navy, and of these not more than three on board any one ship.—*Times* from *Le Yacht*.

GERMANY.—The following are the principal promotions and appointments which have been made: Vice-Admiral—Diederichsen to be Chief of the General Naval Depart-

ment at the Ministry of Marine. Rear-Admirals—Diederichsen to be Vice-Admiral; von Ahlefeld to be Chief of the Technical Department at the Ministry of Marine; von Prittwitz und Gaffron to be Inspector of Second Naval Division; Kapitäns zur See—A. Thiele, Borckenhagen, von Dresky to be Rear-Admirals.

Dockyard Notes.—Although the greater part of the building programme for 1902 went to the private yards, the Imperial dockyards have nevertheless been full of work, and there seems no probability of it being found necessary to discharge any workmen during the winter. This is a ground for considerable satisfaction on the part of the *employés* in the yards, as there has lately been a considerable discharge of men from the private yards.

Kiel.—The work of completing the internal fittings of the new armoured cruiser "Prinz Adalbert," which was launched in June, 1901, is making good progress, and the ship should be ready for commissioning next spring. On the slip lies the new armoured cruiser "Ersatz Kaiser," a somewhat larger vessel, which is to be ready for launching next summer; while the work of lengthening the coast-defence battle-ship "Frithjof," and bringing her up to date, as has been done with the "Hagen," "Heimdall," and others of the same class, is being pushed on. There is always plenty of work in the matter of small repairs, as the bulk of the ships in commission belong to the Baltic yard.

With the beginning of the winter season has come a re-organisation of the IVth and Vth Torpedo-boat Divisions: the IVth Division will be composed of Nos. S 91 and S 92, which only recently returned from two years' service in China, but with their boilers and machinery in excellent condition, and the three new boats Nos. S 105, S 106, and S 107; the Vth Division of five new boats lately completed at the Germania Yard, Nos. G 108, G 109, G 111, G 112, and G 113.

Wilhelmshaven.—The repairs and work of modernising the first-class battle-ship "Wörth," which was paid off in August last after a seven years and a half commission are being pushed on, and a similar work has also been taken in hand with her sister ship the "Weissenburg," which was paid off here at the conclusion of the manœuvres a month ago after having been eight years in commission; among other improvements is the removal of all superfluous wood and the substitution of thin steel, iron, or aluminium instead, the improving of the ventilation, the substitution of submerged torpedo-tubes for the above-water ones, and the substitution of water-tube boilers for the old cylindrical ones.

Boundaries of Stations.—The area of sea assigned to the stations of the German Navy has now been defined by Cabinet order. The Baltic station remains as before, and the North Sea station is bounded on the north by the 60th parallel, on the west by the 3rd meridian west extending from the north of Scotland, and on the south by a line from Dover to Calais. Outside this is the European station, which extends northward to the 80th parallel and eastward to the 60th meridian, the boundary being continued by the north and west coasts of Europe and Africa, with parallel 32 as the southern limit and 40° west longitude to the coast of Greenland as the western. The Mediterranean station includes the whole of the waters of that sea. The West African station lies south of the European, with the African coast and meridian 20 limiting it on the east and the 60th parallel on the south, the western boundary lying 29° west as far as latitude 10° north and 40° west up to the northern limit. The East African station includes the Red Sea and Persian Gulf, its eastern limit being the 60th meridian and its southern the 60th parallel and its western boundary the East African coast and

the 20th meridian east from Greenwich. The East Asian (or China) station is bounded by the East African station and the Asian coasts on the western and northern sides, and extends eastward to 180°. Its southern boundary is the 20th northern parallel on the eastern side of Australia, and the 10th southern parallel from 131° west to the western limit. The Australian station includes the Australian coasts and South Sea Islands being limited on the north and west by the stations already described, with the 60th parallel on the south and the 130th meridian on the east extended to 180° at the northern end to include the Marshall Islands. The West American (or Pacific) station includes the whole of that ocean to the limits of the East Asian and Australian stations and to 60° south latitude, with the coasts of North and South America and the 70th meridian west from Greenwich on the east. The East American (or Atlantic) station lies between the station last named and the European and West African stations.—*Marine Rundschau* and *Neue Preussische Kreuz-Zeitung.*

Wind-Pressure Gauge.—The German Government recently offered three prizes of the value of £250, £150, and £100 for the three best types of wind-pressure gauge. The technical conditions which must be fulfilled are as follows:—1. The pressure gauge must be arranged so as to show the strength of the resultant force of the wind pressure on flat surfaces and on bodies, including the suction action on the leeside, in such a manner that the observations taken can be used for statistical purposes. 2. It is desirable that the pressure gauge should show the direction of the measured resultant force against the measured surface, clearly and unmistakably. 3. The pressure gauge must show the strength of the wind pressure automatically so that an uninterrupted record of its force and duration may be obtained. 4. Any instrument in which is taken into consideration the velocity of the wind in arriving at the results will be thereby debarred from entering into the competition. The other regulations to be observed are as follows:—1. The competition is open to all persons at home and abroad. 2. Competitors must fix at their own cost their instruments or working models thereof at the Deutsche Seewarte, Hamburg, and furnish the drawings and calculations necessary to explain their working and construction. The whole must be accompanied in each case by a distinguishing word or mark, and must reach the Deutsche Seewarte before 1st April, 1903. Anything sent after that date will not be considered. The distinguishing word or mark must also be placed in a separate envelope, together with the address to which the instrument is to be returned. In the case of foreigners, the address of a representative in Germany must be given. Yet another envelope must contain the name of the inventor. This envelope will only be opened should the inventor be a prize-winner. 3. In addition to the three prizes already mentioned a further prize of £150 will be given to the inventor of the instrument which, after a prolonged test shall be adopted by the Government for its own use. Before this prize is awarded the inventor will have to state how many of his instruments he is prepared to deliver at the price named by him. 4. The plans of the instruments for which prizes are awarded will become the property of the Deutsche Seewarte.—*Times* from *Marine Rundschau.*

The German Naval Manœuvres of 1902.—The following *résumé* is taken from the account of the Special Correspondent of the *Kreuz-Zeitung* who was on board the "Kaiser Wilhelm II.":—The Manœuvre fleet this year was composed of the First and Second Squadrons, with two torpedo-boat flotillas.

Admiral von Koester, Commander-in-Chief at Kiel and Inspector-General of the Navy, was again appointed to the supreme command, with Captain Breusing as his Chief of Staff.

The First Squadron, which was under the command of Admiral H.R.H. Prince Henry of Prussia, was composed of the following vessels :—

First Division.

First-class battle-ships—"Kaiser Friedrich III." (flag-ship of Commander-in-Chief), "Kaiser Wilhelm der Grosse," "Kaiser Karl der Grosse."

The fourth ship of this Division, the "Kaiser Wilhelm II.," was withdrawn to serve as the flag-ship of Admiral von Koester.

Second Division.

First-class battle-ships—"Kurfürst Friedrich Wilhelm" (flag-ship of Rear-Admiral von Prittwitz u. Gaffron), "Brandenburg," "Weissenburg," "Kaiser Barbarossa."

Scouting Division.

First-class armoured cruiser—"Prinz Heinrich."

Second-class protected cruisers—"Victoria Luise," "Freya."

Third-class protected cruisers—"Amazone," "Niobe," "Hela."

Gunnery training-ship—"Grille."

First Torpedo-boat Flotilla.

Korvetten-Kapitän Scheer, senior officer in command with his pennant flying in S 106.

A (II.) Division-boat S 102—Nos. 103, 104, 105, 107.

B (III.) „ S 101—Nos. 96, 98, 99, 100.

The Second Squadron, under the command of Rear-Admiral Fritze, was formed of battle-ships of the Baltic and North Sea Reserve Divisions, specially commissioned for the manœuvres, and was composed of the following ships :—

First Division.

Third-class battle-ships—"Baden" (flag-ship of Commander-in-Chief), "Württemberg."

Coast-defence battle-ship—"Beowulf."

Second Division.

Coast-defence battle-ships—"Hildebrand" (flag-ship of Rear-Admiral Galster), "Heimdall," "Hagen."

Second Torpedo-boat Flotilla.

Korvetten-Kapitän Wilbrandt, senior officer in command, with his pennant flying in S 94.

C (VI.) Division-boat S 94—Nos. 91, 92, 93, 95.

D (I.) „ D 3—Nos. 68, 69, 70, 71, 72, 73.

The Scouting Division was divided into two groups, consisting of :—1. "Victoria Luise," "Amazone," and "Hela." 2. "Prinz Heinrich," "Niobe," and "Nymphe." The "Freya" took part in the manœuvres only from the 1st September to the conclusion ; the torpedo-depôt ship "Pelikan" and the aviso "Zieten" for the final strategical manœuvres between the 14th September and the 18th. The First Squadron assembled at Kiel, and the Second at Danzig by the 16th August.

On Sunday, the 17th August, Admiral von Koester hoisted his flag on board the "Grille" at Kiel, embarking with his staff temporarily on board that vessel, as he proposed to utilise the passage of the First Squadron to Danzig in order to carry out a strategical exercise before the two squadrons combined at that anchorage. Nobody in the First Squadron seems to have been aware of what was intended. At 8 p.m. the cruisers and torpedo-boats received orders from the Commander-in-Chief of the First Squadron to get up steam as quickly as possible, and receiving their orders they left

the harbour at midnight, the battle-ships following the next morning at 9. The scheme of operations was as follows :—A hostile squadron, represented by the Second Squadron, had left Dantzig with the object of forcing its way into the western portion of the Baltic towards Kiel ; as, however, it was considerably inferior in fighting power to the German fleet, represented by the First Squadron, the intention was *en route* to effect a junction with another friendly squadron—this last was understood, but not represented by any ships—which was coming through the Belt. The German squadron, on the other hand, had to find the enemy before he could effect his junction, force him to battle and destroy him. As the time when the enemy left Dantzig was approximately known, the Commander-in-Chief of the German squadron, in view of the speed of his ships, could count with fair certainty on meeting him, his chief difficulty lying in the fact that the time when he must be intercepted, if the junction was to be prevented, would fall during the night. Naturally, moreover, it was not known what course the enemy would steer, as he had the whole breadth of the Baltic before him, with sufficient time for him to avoid steering directly for the southern outlet of the Sound, and to effect his junction with his expected reinforcement by some pre-arranged circuitous route. In view of these possibilities the German admiral had despatched his cruisers and torpedo-vessels in advance to scout for the enemy, keep in touch with him, and at the same time communicate the information by signal to the battle-ship squadron. That the cruisers had not a very easy task before them is evident from the fact that the Baltic at its narrowest point is almost ninety miles across, and is divided there into two channels by Bornholm Island ; by either of these two channels could the enemy pass, and there was only five cruisers available to watch this long stretch of water. Although the torpedo-boats were also employed on this duty, yet from their lowness in the water their range of vision is extremely limited. Their proper rôle is to attack the enemy, but if it is necessary to withdraw them to act as cruisers, it is evident they cannot perform the work for which they are intended.

About 8 p.m. on the 18th August the battle-ships were so close to the zone through which the enemy must pass, that the ships by signal cleared for "action," and during the night half the men were kept at the guns, the officers at their posts, while steam was got up in readiness for full speed, while all lights were kept carefully concealed, a matter of considerable importance, as even the reflection of the smallest light on the water might betray the presence of the squadron to the enemy, and enable him, himself unseen, to avoid being drawn into an action.

Some hours went by without any sign of the enemy, but shortly after midnight the reflection of a search-light was seen, and a faint sound of distant firing heard, apparently from one of the cruisers. Course was immediately altered, and the squadron proceeded at full speed in the direction of the flash, but nothing more was seen, while the sound of the firing soon died away, and it became evident that the cruisers had failed to maintain their touch. When day broke it became evident that the enemy had escaped and succeeded in his object of effecting a junction with the friendly squadron. It afterwards transpired that the Second Squadron, representing the enemy, had kept close under the Swedish coast, passing beyond the furthest of the cruisers, by whom however it was sighted, and that the failure of the German squadron to intercept it was due partly to the distance and partly to the cruisers not being in proper touch with the main body of the fleet.

The First Squadron then proceeded to Dantzig, where it arrived on the following morning, and the whole fleet was assembled under the Commander-in-Chief, who now transferred his flag and staff to the "Kaiser Wilhelm II.," which was temporarily withdrawn from the First Squadron, which was thus left with only seven battle-ships.

The fleet assembled in the roadstead certainly presented an extraordinary muster of different types, among which, unfortunately, antiquated vessels predominated. A certain progress in cruisers was manifest over last year, the four small vessels of the "Amazon" class being all new; on the other hand, the "Victoria Luise," powerful ship as she is in some respects, owing to her comparatively speaking low speed and small coal stowage is not well fitted for scouting work. With regard to the coast-defence ships of the "Hagen" class, although their lengthening has given them a greater power of keeping the sea, yet their tactical value as units in a squadron for fighting an ocean battle can hardly be considered great. The Second Squadron and Second Torpedo-boat Flotilla laboured under the disadvantage of having only been mobilised a few days before the assembling of the fleet, and half their crews were made up of reservists; according to the regulations the reservists are supposed to be drafted to ships of the same class on board of which their time of active service was spent; but however this may be in the future, it would not be possible at present, were a general mobilisation ordered, to carry this regulation out, although it is a matter of the first importance for ensuring the homogeneity of our battle-ships. The manœuvres of the fleet at present are naturally unfavourably influenced by the circumstances of its composition, as mentioned above. The speed of the squadrons is limited to that of the slowest ships, and the power of cruising to the coal-endurance of the smaller vessels, while on both sides old and obsolete and small ships are obliged to have fictitious fighting values attached to them, which naturally gives an air of unreality to the scheme of operations. Strategical manœuvres on a large scale, such as are carried out yearly by England and France, are with us for the present impossible, for which the small number of cruisers available is in a considerable measure responsible. In view of the state of the *matériel* of our fleet much greater efforts are thrown on the officers and men in order to attain the highest point of efficiency, as, should war break out to-day, the fleet assembled for the manœuvres is all we have to depend on at sea.

The inspection of the ships by the Commander-in-Chief was carried out on the 20th and 21st August, and on the two following days the fleet was taken to sea each day and tactical exercises carried out in the forenoon; in the afternoon the two squadrons were exercised against each other in battle tactics, the torpedo-boats also being given opportunities to attack; in the evening the fleet anchored inside Hela Point. On the evening of the 23rd, a torpedo-boat attack on a pre-arranged scheme was carried out. A hostile fleet, represented by the First Squadron, had bombarded Dantzig, but had been detained longer off the town than had been originally intended; the delay was unfortunate, as the admiral was aware that a squadron superior in strength to his own was *en route* to relieve the town. It was thus imperative on him to avoid an action, so he determined to leave the bay after dark and under cover of the night to gain the open sea; but as the enemy would guess his intentions and was provided with cruisers and torpedo-boats, it was necessary to proceed without showing any lights, and to steer a devious course and not stand straight out to sea round the peninsula.

The First Squadron accordingly weighed as soon as night fell, and shaped a course, keeping well over to the opposite side of the bay, while the ships were cleared for action. The night was clear with a bright moon, which was thus favourable for the enemy's cruisers and torpedo-boats, as far as giving them a good chance of discovering the enemy went, on the other hand, it gave the battle-ships every chance of destroying the torpedo-boats by the fire from the Q.F. guns, before they could approach near enough to use their torpedoes with effect.

The hostile cruisers on arriving off the bay formed a line across between Heisternest and Pillau, through which the First Squadron would have to pass, in order to reach the open sea; but as they were too few in number to watch so wide a stretch, so as to make certain that no vessels could pass unperceived, some of the torpedo-boats were used to fill up the intervals in the cruiser line, while in the centre the rest of the boats were stationed in readiness to attack the enemy as soon as his position was discovered.

Shortly before midnight a signal rocket was observed seaward, which showed the commander of the First Squadron that he was discovered, and shortly afterwards the hull of a large cruiser showed up clearly in the moonlight, but she had ventured too close, so a heavy fire was opened upon her, and she speedily disappeared again, having however made known by her signal rockets to the torpedo-boat flotilla that the enemy had been discovered. Whether the cruiser should have been considered out of action was an open question, but not one of importance, as she had already signalled the presence of the First Squadron before she was discovered. A torpedo-boat was soon discovered on each bow, but they kept out of range, evidently intending merely to keep touch until the boats told off for the attack should come up.

About half-an-hour later the attack was suddenly made; the search-lights were turned on in an instant and the boats brought under their glare, while a heavy fire from the quick-firers, machine-guns, and rifles was poured upon them. The attack, however, was pressed home, the boats only remaining under fire long enough to discharge their torpedoes. What the result would have been in actual warfare it is impossible to forecast, but the boats were excellently handled. The Commander-in-Chief himself was on board one of the attacking flotilla. After the attack the ships returned to the anchorage, the torpedo-flotillas anchoring off Neufahrwasser.—*To be continued.*

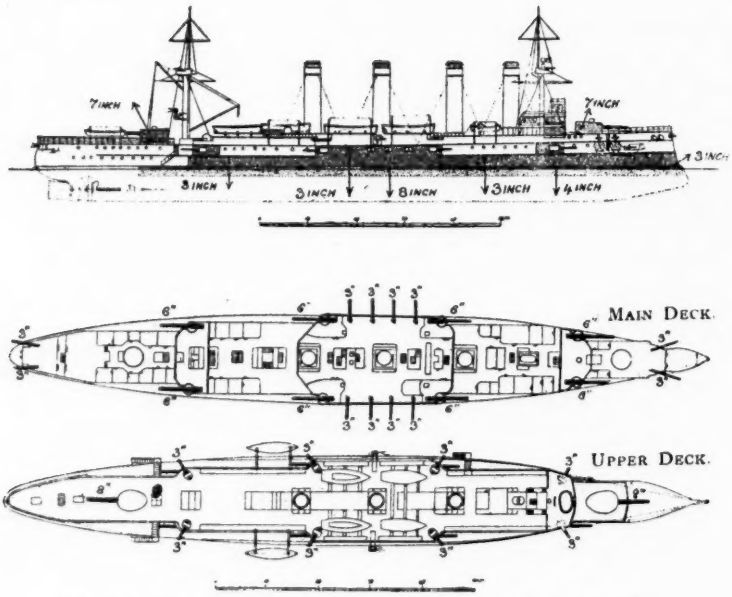
RUSSIA.—*The Imperial Russian Cruiser "Bayan."*—The new first-class armoured cruiser "Bayan" has recently completed her trials most successfully off Toulon; her engines developing 17,400-I.H.P., or 900-H.P. over the contract, and giving the ship a speed of 22 knots, instead of the 21 knots guaranteed. Her Belleville boilers worked without a hitch. The ship has been built by the Forges et Chantiers de la Méditerranée, at La Seyne, near Toulon.

Her dimensions are as follows:—

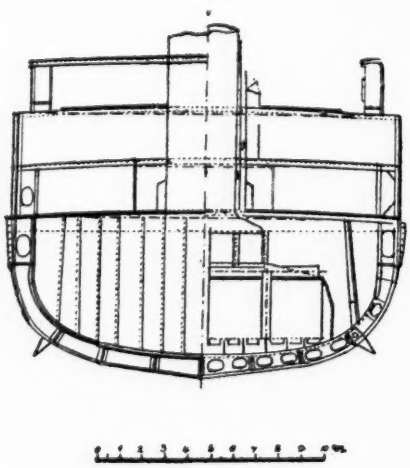
Displacement	7,800 tons
Length	443 feet
Beam	55¾ feet
Draught (mean)	22 feet
Guns (all quick-firers)	Two 8-inch
" "	Eight 6-inch, 45 calibres
" "	Twenty 3-inch (12-pounders)
" "	Seven 3-pounders
Torpedo-tubes	Two submerged
"	Three above water

The guns are all Russian, from Obuchoff; the torpedo-tubes, in the case of those submerged, are of the Elswick patent, which La Seyne has already had fitted to other of its ships.

Protection is afforded by a Krupp steel water-line belt, which reaches from the bow to the base of the mainmast, varies from 8 inches to 4 inches in thickness, and reaches from 4 feet below to 2 feet above the water-line, and is associated with a curved protective deck, which is 2 inches thick on the slopes. The belt is about 360 feet long, or a little more.



PROFILE, DECK PLANS, AND HORIZONTAL VIEW OF THE RUSSIAN ARMOURED CRUISER "BAYAN."



MIDSHIP SECTION.

Above the water-line belt is a belt of thin armour protecting the lower deck. This is 3 inches thick, and extends 335 feet from the extreme bow. It will just keep out shell from 6-inch guns, but not shot. This belt protects the lower deck and two of the three above-water torpedo-tubes. The third tube, in the stern, is unprotected. This upper belt covers the lower deck and reaches to the main deck, upon which all the 6-inch guns are carried. On this deck there are three separate redoubts, all 3 inches in thickness. The forward and after ones both contain a pair of 6-inch guns, one on either side. The central and large redoubt contains four 6-inch guns, and also eight 3-inch 12-pounders, carried four each side. This is a novel feature. Above each 6-inch gun 12-pounders are carried behind shields. The remaining four are on the main deck—two well forward and two right aft. On the forecastle, and aft on the upper deck, are the two 8-inch guns, each in a closed balanced turret, 7 inches thick. The ammunition hoists of these are 3 inches thick. There is also a 3-inch tube protecting the voice-pipes, etc., from the conning-tower, which last is 6½ inches thick and placed rather high up.

All Russian ships carry plenty of search-lights. The "Bayan" has one in the fore-top, one carried low on the mainmast, one in the bow under the forecastle, one in the stern, and one each side amidships carried on top of the central battery.

The engines are designed to work up to 16,500-I.H.P., with an estimated speed of 21 knots, which, according to contract, has to be maintained for 12 hours, and as we have stated above, has been exceeded by a knot. Steam is provided by twenty-six Belleville boilers, fitted with economisers, and placed in four groups. The stokeholds are eight in number, and each contains three boilers, except the aftermost pair, which contains four each. The coal carried is 750 tons, but there is a stowage room for 1,100 tons. This—as with water-tube boilers the consumption for all purposes is approximately a ton a knot—gives the ship a full-speed radius of about 1,300 miles, or, allowing for Russian stokers—say, 1,000 miles, or 40 hours' steaming. It will also work out at about 3,000 miles at 18 knots. Theoretically, of course, the radius is larger, but theoretical radii generally omit the chief item of consumption—auxiliary purposes. The "Bayan" has two screws. The ammunition carried is as follows :—

For each	8-inch gun	100 rounds
„	6-inch „	150 „
„	3-inch „	250 „
„	3-pounder gun	500 „

Launch.—The new first-class Russian cruiser "Otckakov" was launched in the presence of the Tsar at Sevastopol on 4th October. Her dimensions are as follows :—Length over all, 439 feet 7½ inches ; on the water-line, 433 feet 5½ inches ; beam, 54 feet 5½ inches ; draught, with a full load, 20 feet 7¼ inches ; displacement, 6,570 tons. The engines are to develop 19,500-H.P., steam being supplied by 16 Normand Sigaudy boilers, which with 150 revolutions, are to give a speed of 23 knots ; normal bunker capacity, 720 tons ; special, 1,100 tons. In building her hull 2,000 tons of Siemens-Marten steel have been used. The thickness of her armour deck will vary from ¾ inch to 2¾ inches ; the thickness of the protection for her casemates will be 3⅛ inches ; for her turrets, 5 inches ; and for her conning tower, 5½ inches. Her armament will consist of twelve 6-inch guns of 45 calibres—four in turrets, four in casemates, and four with shields ; twelve 2·95-inch guns ; six 1·85-inch Hotchkiss guns ; and two submerged torpedo-tubes. She will be fitted with eight turbines, worked by electric motors and capable of raising 3,800 tons

of water in an hour, and also with four pumps for the circulation of water in her boilers to the extent of 4,000 tons in an hour. She was begun on 7th March, 1901.—*Kronstädstki Viéstnik.*

Vessels Building.

Name.	Displacement, tons.	Where building.	Remarks.
Battle-ships.			
X	12,000	... ...	Projected.
X	12,000	... ...	„
X	12,000	... ...	„
X	12,000	... ...	„
X	12,000	... .	„
Slava	13,516	St. Petersburg	Not yet launched.
Orel	13,516	„	Launched May, 1902.
Kniaz Suvarov ...	13,516	„	Launched 25th Sept., 1902.
Borodino	13,516	„	Launched 8th Sept., 1901.
Imperator Alexander III.	13,516	„	„ 3rd Aug., 1901.
Tsarevitch	12,900	La Seyne, France ...	„ 23rd Feb., 1901.
Kniaz Potemkin Tavricheski ..	12,585	Nicolaieff, Russia ...	„ 9th Oct., 1900.
X	12,585	„ „	Not yet launched.
Pobieda	12,674	St. Petersburg	Completed.
Osliabya	12,674	„	Nearly completed.
Admiral Boutakov	5,000	„	Not yet launched.
X	5,000	... ...	Projected.
Cruisers.			
Bayan	7,800	La Seyne, France ...	Launched 12th June, 1901, completing.
Oleg...	6,600	St. Petersburg	Ordered.
Kagul	6,250	Nicolaieff, Russia ..	Not yet launched.
Otchakov	6,250	Lazarev, „	Launched 4th October, 1902.
X	6,375	Libau, „	
Vitiaz	6,375	St. Petersburg	Destroyed by fire 13th June, 1901.
X	6,375	„	Injured „ „
Aurora	6,630	St. Petersburg	Injured by fire 13th June,'01.
Pallada	6,630	... ...	Completed.
Diana	6,630	St. Petersburg	„
X	—	Schichau, Dantzic ...	Not yet launched.
Boyarin	3,000	Copenhagen	Launched 8th June, 1901.
Kalgoula	3,200	Nicolaiev	Not yet launched.
Almaz	3,200	St. Petersburg	„ „
Jemchug	3,200	„	Ordered.
Izumrad	3,200	„	„
Miscellaneous.			
Kamchatka (Collier)	7,200	St. Petersburg	Not yet launched.
Imperial Yacht ...	(?)	(?)	No recent information.
Okean	12,000	Kiel	Launched 8th Feb., 1902.
Torpedo-Boat Destroyers.			
Baklan	350	St. Petersburg	Launched 12th Aug., 1901.
Bekass	350	„	Building
Gorlitsa	350	„	„
Kulik	350	„	„
Perepel	350	„	„
Skvorets	350	„	„
Strij...	350	„	„
Chtchegol	350	„	„
Albatross	350	„	„

Vessels Building—contd.

Name.	Displacement, tons.	Where building.	Remarks.
Torpedo-Boat Destroyers—contd.			
Drozd	350	,, ...	Building.
Diatel	350	,, ...	,,
Bezuprechin ...	350	,, ...	Ordered.
Givol	350	,, ...	,,
Givucan	350	,, ...	,,
Giatky	350	,, ...	
Giarky	350	,, ...	
Javidni	350	,, ...	
Zavetni			
Osiotr	312	Havre	Practically complete.
Kefal	312	,, ...	Launched 28th Nov., 1901.
Filin	240	Ijora Works, Russia ...	Practically complete.
Gagara	240	,, ,, ...	,, ,,
Krecet	240	,, ,, ...	Building.
Korsum	240	,, ,, ...	,,
Sowa	240	,, ,, ...	Practically complete.
Voron	240	,, ,, ...	,, ,,
Berkut	250	,, ,, ...	,, ,,
Nyrok	250	,, ,, ...	,, ,,
Yastreb	250	,, ,, ...	,, ,,
Torpedo-Boats.			
Akoula	150	St. Petersburg	Launched 24th Aug., 1901.
Bytchek	150	,, ...	,, ,, ,,
Keta	150	,, ...	Building.
Makrel	150	,, ...	,,
Nalim	150	,, ...	,,
Okun	150	,, ...	,,
Paltus	150	,, ...	,,
Pescar	150	,, ...	,,
Piotva	150	,, ...	,,
Sig	150	,, ...	,,
X	150	,, ...	Ordered.
X	150	,, ...	,,
X	150	,, ...	,,
X	150	,, ...	,,
X	150	,, ...	,,
Submarine Boat.			
(Kuteinikov type.)	20	Kronstadt...	Ready for trial.
2nd ,,		,, ...	Ordered.

The Russian Reinforcements for China.—As far back as in March last it was announced in the *Kronstädtski Viéstnik* that the Russian authorities were beginning to see weak points in their naval position in the Far East and that, among other arrangements, a considerable reinforcement of naval strength was in contemplation. The squadron out there had been reduced when the trouble with China came to an end by two battle-ships, the "Sissoi Veliki" and "Navarin," and three cruisers, the "Dmitri Donskoi," "Vladimir Monomach," and "Admiral Korniloff." To replace these vessels only one battle-ship and one cruiser had been sent out, and the squadron on the station then consisted, in these two classes, of four battle-ships and five cruisers, all of recent date and with modern characteristics, as shown in the following table :—

Class.	Name.	Age.	Displacement.	H.P.
Battle-ship	Poltava	1894–95	10,960	11,500
,, ...	Petropavlovsk	1894–95	10,960	11,500
,, ...	Sevastopol	1894–95	10,960	11,500
,, ...	Peresviet	1898–99	12,674	14,500
Armoured Cruiser ...	Gromoboi	1899	12,330	14,500
,, ,, ...	Rossia	1896	12,130	14,500
,, ,, ...	Rurik	1894	10,923	13,250
,, ,, ...	Admiral Nachimoff ...	1885	8,524	9,000
Protected Cruiser ...	Varyag	1899	6,500	20,000

In view of several circumstances, notably the Anglo-Japanese alliance represented in the Far East by ten battle-ships and more than a dozen first-class cruisers, it was felt that the force at the command of the Russian admiral was insufficient, and the following vessels were named as a reinforcement to be despatched :— The third-class cruiser "Novik" in May, the battle-ship "Retvizan" in June, the second-class cruisers "Askold" and "Bogatyr" in July, the armoured cruiser "Bayan," the second-class cruiser "Diana," and the third-class cruiser "Boyarin" in August, and before the end of the year the battle-ship "Pobieda" and the second-class cruiser "Pallada." Many causes contributed to delay the departure of these ships, and in the squadron which anchored for a few days at Portland at the end of last month are those that have been completed for service and are on their way out.

The flag-ship of the squadron is the "Retvizan," which is specially interesting as the product of an American shipyard—indeed she is the first important foreign battle-ship to have been built in the United States. The Cramp Shipbuilding Company, of Philadelphia, received orders from the Russian Government for this vessel, and for a cruiser, the latter, the "Varyag," making her trials last year, when she attained a speed of 23 knots, becoming, therefore, one of the fastest men-of-war afloat. The "Retvizan" is the battle-ship, and she also made a successful trial, steaming at an average speed of 18·8 knots on a 12 hours' run. Her vital parts are protected by a belt of 9-inch armour, which extends from 4 feet below the water line to 3 feet above, and behind this is an armoured belt 2 inches on the flat and 4 inches on the slopes, with coal between the belt and the slope of the deck. Above the 9-inch belt is another one 6 inches in thickness to protect the guns from shell bursting below the deck, on which the bulk of them are placed. The 6-inch guns are in casemates of 5-inch steel, while the belts are carried across the ship, and above the bulkheads thus provided is one of 2-inch steel enclosing the battery. The heavier guns are carried in pairs in two turrets placed before and abaft the central citadel protected by 10-inch armour. Steam is provided to 16,000-H.P. engines by Niclausse water-tube boilers, and, as well as 2,000 tons of coal, liquid fuel can be carried in the double bottom. The *Scientific American* says of the "Retvizan," that she is "unquestionably an exceedingly fine specimen of the up-to-date first-class battle-ship." The "Pobieda" will be remembered as the representative of the Russian Navy, which came to Spithead for the Coronation Review. She differs but slightly from the "Peresviet," which is already on the China station, the armament is similar, but the belt which in the "Peresviet" extends for only five-sixths of her length is complete in the "Pobieda." The latter on her trial made 18·5 knots, steam being supplied to engines working up to 15,492-H.P. (nominal 14,500) by Belleville water-tube boilers. The arrangement of the armour is in principle similar to that in the "Retvizan," and the coal supply is good. The following table will facilitate

a comparison betwen the chief characteristics of these two vessels and the heaviest British and Japanese battle-ships on the station :—

——	"Retvizan."	"Pobieda."	"Glory."	"Mikasa."
Length	374	401	390	400
Beam	72·6	71·6	74	76
Draught	25	26	26	27·2
Tonnage	12,700	12,674	12,950	15,000
Armament ...	Four 12-in. Twelve 6-in. Twenty 3-in. Twenty 3-pdrs. Six 1-pdr.	Four 10-in. Eleven 6-in. Sixteen 3-in. Ten 2-in. Sevent'n 1·5in	Four 12-in. Twelve 6-in. Twelve 12-pdrs. Six 1-pdr. —	Four 12-in. Fourteen 6-in. Twenty 12-pdrs. Eight 3-pdrs. Four 2½-pdrs
Heaviest Armour Protection :				
Guns ...	10-in.	9-in.	12-in.	14-in.
Belt... ...	9-in.	9·5-in.	6-in.	9-in.

The three cruisers which form part of the squadron are not of first-class importance. The "Diana" and the "Pallada," of 6,630 tons displacement each, are sometimes referred to as "commerce destroyers." They made on their trials, the "Diana" 19·3 knots with 12,129-I.H.P., and the "Pallada" 19·2 knots with 13,100-I.H.P. They have protective decks 2½ inches thick, and the armament, protected by shields, consists in each vessel of six 6-inch, twenty 3-inch, and eight 1·4-inch Q.F. guns. The "Bogatyr" is a vessel displacing 6,100 tons; she was built at the Vulcan Yard, Stettin, and is reported to have attained a speed of 24 knots, her engines developing 20,500-I.H.P. Her machinery is not entirely beneath the protective deck, and where it rises above the water-line is covered by armoured hatchways. She carries twelve 6-inch, twelve 3-inch, and nine smaller guns. With their speed, if it can be maintained at sea, these vessels should prove useful scouts; they will not, however, add largely to the fighting strength of the Russian force in the Far East. A smaller cruiser, the "Boyarin," is expected to join the squadron either at Portland or at Vigo, where it is expected to call on its voyage out.—*Times.*

UNITED STATES.—*The New First-class Battle-ship "Virginia" and Sisters.*—The five great battle-ships of the "Virginia" class form by far the largest and most important addition as yet made to the United States Navy. Never before have so many armoured ships of one class been built, and never a vessel of the great displacement of 14,948 tons. The "Maine" of 12,300 tons is a big ship, but the "Georgia" will be larger by 2,648 tons. The story of the increase is shown in the accompanying table.

Battle-ship.	Authorised.	Length.	Displacement.
Texas	1886	301 feet	6,315 tons.
Oregon	1890	348 „	10,288 „
Kentucky	1895	368 „	11,540 „
Maine	1898	388 „	12,300 „
Virginia	1901	435 „	14,948 „

The vessels of the "Virginia" class will be known as the "Georgia," "Nebraska," "New Jersey," "Rhode Island," and "Virginia." The first three were authorised on

3rd March, 1899; the last two on 7th June, 1900, but no commencement was made with any of them until the beginning of the present year. The accepted design was only arrived at after a long controversy in the Naval Board of Construction, which was prompted by the revival of the question of the superposed turret. As first designed, the "Georgia," "Nebraska," and "New Jersey" were to be of 14,650 tons displacement, and their main armament was to consist of four 12-inch and eight 8-inch breech-loading rifles, and twelve 6-inch rapid-fire guns, besides a dozen of the new 3-inch rapid-fire pieces, the 8-inch guns to be carried in four separate turrets as in the "Oregon." In the following year, when the battle-ships "Virginia" and "Rhode Island" were authorised, the acceptance and gunnery trials of the superposed turrets on the "Kearsarge" had made such a favourable impression that an agitation was started in favour of reviving this form of turret on the two new ships. The suggestion was opposed by the Board of Construction, the same arguments being used as in the discussion over the "Kentucky" and "Kearsarge." Ultimately, as a compromise, it was decided to build three ships with and two without the superposed turrets, and a few months later the Board, for the sake of uniformity, declared in favour of building the whole five ships with superposed turrets.

Of course, the most striking novelty in these magnificent ships is their great size. As compared with the "Maine" class, the length has gone up from 388 feet to 435 feet; the beam from 72 feet 2½ inches to 76 feet 2½ inches; while the normal draught is 3 inches greater, or 23 feet 9 inches, as against 23 feet 6 inches. Great size has distinct advantages in the way of seaworthiness, a stable gun platform, and a wider margin of floatation when the water-line is being pierced in a close action. The greater displacement of the "Virginia" class has been judiciously distributed among guns, armour, and motive power. They will be the fastest, best protected, and most powerfully armed ships in the United States Navy, and the most powerful in any Navy. A great improvement over the "Maine" class will be seen in the uniform freeboard of 20 feet from bow to stern. Apart from the military advantage gained in the added command of the guns of the main battery aft, there will be a net gain in accommodations, which will contribute greatly to the comfort and healthfulness of both officers and crew. None of them will be shut up behind blank walls of heavy armour, and lighted only by artificial means, the living spaces all having air ports and direct access to sunlight. The added freeboard aft, too, will make the ships more weatherly in a following sea.

The hull will be protected by an 8-foot belt reaching from stem to stern, which will extend 5 feet below and 3 feet above the water-line at normal draught. From the top to the water-line the belt will be 11 inches through, and thence to the lower edge it will taper to 8 inches. These dimensions will be maintained throughout the engine and boiler-room spaces for a distance of 192 feet. Forward and abaft of this the belt will taper in thickness to a minimum of 4 inches at bow and stern. Above the main belt, for a distance of 245 feet amidships, *i.e.*, throughout the position of the main broadside rapid-fire battery of 6-inch guns, the sides will be reinforced by armour of a uniform thickness of 6 inches This armour will reach all the way up to the main deck, and it will be joined to the barbettes of the 12-inch turrets by athwartship armour of 6 inches in thickness aft, and by inclined armour of like thickness forward, yielding, in this latter case, the added protection of glacis against the head-on raking fire of an enemy. The after athwartship armour is vertical. There will be a curved protected deck from bow to stern, which will be 1½ inches thick on the flat and 3 inches thick on the slopes. A cellulose belt 3 feet in thickness will be worked continuously from bow to stern along the sides above the protected deck. The obturating material

will be the well-known corn-pith cellulose. Wood will be used very sparingly, and, where indispensable and not exposed either to the weather or under water, will be fireproofed. Light metal bulkheads will supplant the usual wooden partitions in the living spaces; some of the furniture will be of pressed metal; the chart-house will be of bronze; and all of the decks under cover will be laid with linoleum. To guard against the overheating of the magazines, there will be a 4-inch air space around them in addition to a coating of some non-conducting material, while certain of the magazines are to be arranged so that they may be chilled by compressed air from the refrigerating plant.

The fighting powers of the vessels will be centred in the main battery of four 12-inch and eight 8-inch breech-loading rifles, the main rapid-fire battery of twelve 6-inch breech-loading rifles, the secondary rapid-fire battery of twelve 14-pounders and a dozen 3-pounders, and the auxiliary battery of eight 1-pounders, two field pieces, two machine guns, and half a dozen 0·3 automatic guns. All the heavy guns will be of the new smokeless-powder, long-calibre type.

The four 12-inch rifles will be mounted in two elliptical, balanced turrets 10 inches thick, except for the slanting port plates, which will be an inch heavier. These guns will fire through arcs of 270°. Four of the 8-inch guns will be superposed upon these turrets, fixed to move in unison, and they will be sheltered by walls of 6-inch armour increased half an inch on the slanting face plates. The four remaining 8-inch guns will be mounted amidships, two on each side, on the main deck, and will be housed in independent turrets similar to those placed above the 12-inch guns. These 8-inch rifles will have arcs of fire of 180°, ranging from dead ahead to dead astern. This arrangement of the 12- and 8-inch guns gives a bow and a stern fire of six 8's and two 12's, and a broadside of six 8's and four 12's.

The 6-inch guns are arranged in broadside. Each gun, of which there are six on each broadside, has an arc of fire of 110°, and the ports are so arranged that the guns can be turned inboard within the side line, the two forward pairs swinging forward, and the other eight guns swinging aft, the recesses being long enough to bring the muzzle of the gun almost flush with the side of the ship. This arrangement does away with the inconvenience of dismounting the guns to avoid obstructions or to guard them against the stress of heavy weather. Each of these guns is sheltered behind a heavy port shield, and there is a splinter bulkhead of 2½-inch nickel steel between each gun and its neighbour on either side. The twelve 14-pounders, sheltered by local armour of 2-inch steel and by shields, are to be mounted eight on the gun deck well forward and aft, and four up in the superstructure on the main deck, aft of the amidship 8-inch turrets. The twelve 3-pounders are to be mounted on the bridges and on the superstructure deck, while the 1-pounders, automatic and otherwise, and the Gatlings, are to be placed in the tops and in the boats. The submerged torpedo-tubes, of which there are two, are to be placed one on each side, well forward, and the operator is to control his tube from an armoured station on the deck above, sufficiently sheltered to be proof against 6-pounder fire.

The main engines will be of the four-cylinder triple-expansion type, driving twin screws, capable of developing 19,000-I.H.P., and designed to drive the ship at 19 knots. The steam pressure will be 250 lbs., and the cylinders will be:—High pressure, 35 inches; intermediate pressure, 57 inches; and two low pressures, each of 66 inches diameter by 4 feet stroke. Number of revolutions a minute, 120. There will be twenty-four boilers of the straight water-tube type, placed in six water-tight compartments. They will have quite 1,280 square feet of grate and 55,000 square feet of heating surface. The air pressure in the ash-pits will not exceed 1 inch of water.

Each ship will be fitted as a flag-ship, and accommodations will be provided for 37 officers and 668 seamen and marines; a total complement of 705 persons.—*Scientific American.*

"*Arkansas*" *Class—The Monitor* "*Arkansas.*"—It is safe to say that the four monitors "Arkansas," "Wyoming," "Connecticut," and "Florida," which are now under construction for the United States Navy, are the last monitors that will be built for our own or any other Navy. In the light of modern developments the type is discredited. Indeed, these four will owe their existence to panic legislation during the late war, due to the fear of bombardment entertained by some of the leading Atlantic cities. The monitor is purely a harbour-defence vessel, and would be practically useless, if not, as Sampson's operations off the northern coasts of Cuba and Porto Rico proved, a positive incumbrance in naval operations on the high seas.

The monitor lacks those prime qualities of a fighting ship—seaworthiness, steadiness as a gun platform, habitability, and mobility. As regards this last, one battle-ship, capable of going anywhere and casting loose her guns under any conditions, is worth a fleet of monitors, huddled within a mined and fort-defended harbour, into which an enemy's fleet will in all probability never be so rash as to force an entrance.

The "Arkansas" has a water-line length of 252 feet. The stem is carried well forward below the water and formed into a powerful ram. The maximum beam is 50 feet; and the draught upon the normal displacement of 3,235 tons is 12½ feet. Upon this displacement the ship carries, closely stowed in the bunkers, 400 tons of coal.

The hull is of steel, unsheathed, with an inner bottom reaching up to the armour shelf and ranging fore and aft throughout nearly the whole length of the ship. This intramural space is extensively sub-divided into water-tight compartments, and, like the large, main compartments of the ship proper, it is under the control of a pumping plant of large capacity.

The hull is protected by a continuous band of armour, extending from the main deck line down to a depth of 30 inches below the water-line amidships. This armour has a maximum thickness of 11 inches at the deck line throughout the region occupied by the engines, the boilers, and the magazines, tapering thence to the armour shelf well below water. Forward and abaft the "vital" space the armour is graduated by easy steps till it terminates at the bow and the stern in thicknesses of 5 inches. The protective deck, or, more properly speaking, the main deck, is composed of two thicknesses of ¾-inch plating, of which the upper course is of nickel steel. This is sufficient defence against the acute angle at which most plunging shots would have to strike.

A five-sided superstructure occupies the central portion of the main deck. In the lower half are quartered some of the officers, and there, too, is the galley, the armoury, some wash-rooms, and spare space for the housing of part of the crew, if so desired. On the next deck above, *i.e.*, the superstructure deck, is placed the major part of the rapid-fire portion of the battery. The hammock berthing is also in the superstructure on that deck, lending a very mild protection to the gun crews of some of the smaller pieces. On the bridge or uppermost deck are carried the chart-house, the boats, and all of the 6-pounder rifles. This and the deck just below, like the main deck, being exposed to the weather, are not fireproofed; but the berth deck, being under cover, is covered with linoleum placed right upon the fundamental plating. Wherever possible, woodwork is omitted and supplanted by light metal bulwarks, etc., but where wood is found needful for the sake of health and the saving of weight, it is carefully fireproofed.

The ship is propelled by twin screws driven by two triple-expansion engines, placed in one water-tight compartment. These engines are of the vertical, inverted-cylinder, direct-acting type, each with a high-pressure cylinder of 17 inches, an intermediate-pressure cylinder of 26½ inches, and a low-pressure cylinder of 40 inches, the stroke of all pistons being 2 feet. The collective I.H.P. of the propelling and the circulating pump engines will be 2,400 when the main engines are making about 200 revolutions per minute. Steam is supplied at a working pressure of 250 lbs., by four water-tube boilers, having a total grate surface of quite 200 square feet, and a total heating surface of 88,000 square feet, and capable of supplying all the steam on shipboard when running at full power.

The vessel is lighted by electricity, while the turret mechanisms and all the ammunition hoists will be actuated by the same power. By the adoption of electricity so generally, the presence of long passages of heating steam-pipes is obviated, and in this way alone a very considerable reduction of temperature will be effected under service conditions.

The main battery consists of two of the new 40-calibre, 12-inch breech-loading rifles, and the secondary battery of four 4-inch rifles, while the auxiliary battery includes three 6-pounders and four automatic 1-pounders.

The 12-inch guns are mounted in a single barbette turret of the balanced type, having an inclined face with a pitch of 42°. The armour for the turret and the barbette is 10 and 11 inches thick, and treated by the Krupp process. The four 4-inch guns are mounted on the four principal corners of the superstructure deck, where they will command a wide field of fire. These guns are protected by shields. Three 6-pounders are mounted on the bridge deck, while the 1-pounders are placed on the hammock berthing, amidships, and up in the single top of the military mast. The 12-inch and the 4-inch guns are designed for smokeless powder, the first having a muzzle velocity of 2,809 feet per second, and the latter of 2,900 feet per second, the respective muzzle energies being 46,246 and 1,870 foot-tons.

The ship will carry two search-lights, one forward on the mast and the other upon a stand at the after end of the bridge deck. Every modern facility will add to the equipment and finish of the vessel, and ample quarters and bathing facilities will make life reasonably comfortable for the complement of a captain, six other officers, and 130 enlisted men.

These four vessels will be used to a large extent to meet the growing need of proper schools of instruction for the increasing ranks of the Naval Militia; and it is easy to see how successfully they meet the demand, by covering every practical branch of naval warfare, with the single exception of torpedo duty. – *Scientific American.*

Admiral Bradford on the Employment of Officers.—Rear-Admiral Bradford, Chief of the Bureau of Equipment of the Navy Department, has expressed the sentiments of the entire Navy relative to shore duty for naval officers, in a recent interview on the subject with the representative of the *Army and Navy Journal.* The remarks of Admiral Bradford, coming as they do from an officer of such high standing and ability, are of especial interest, when taken in connection with the President's message :—

"It appears from the public press that the British Admiralty is much disturbed over a want of engineering and mechanical knowledge on the part of Line officers, or, as termed in England, *Executive Officers* of the Navy of Great Britain. The experiment of amalgamating Line officers and engineer officers of the United States Navy is being watched in England with much interest. The Line officers of the United

States Navy are, generally speaking, much better informed in all that pertains to mechanical, electrical, and steam engineering than the officers of any other Navy of the world. This is partially due to accident.

"When the Navy of the United States reached its lowest point of efficiency, about 30 years ago, and was without any formidable ships, even possessing very few ships of any kind, the Navy Department, desiring to at least maintain a corps of officers, cast about for shore work for them to do. Sea-going officers were detailed as inspectors in many industrial establishments of the country; schools were established for the instruction of officers in electricity, chemistry, metallurgy, torpedoes, and other important branches of their profession; and officers were granted leave in order to accept service with manufacturers of armour plate, guns, gun mounts, and other munitions of war. The consequence was that when the construction of the new Navy commenced a corps of specialists had been established, and many officers had become familiar with the complicated mechanisms in use on shipboard. This duty has largely been maintained up to the present time. In addition, the course of instruction at the Naval Academy has included engineering branches, and young Line officers have been required to serve in the engine-rooms of cruising-ships.

"On the other hand, officers of the British Navy have been keep almost constantly at sea; a large amount of sea service is required in order to ensure promotion; not to be appointed to a sea-going ship implies a want of professional aptitude and efficiency. Therefore, all of these officers seek service afloat. Officers of the executive branch of the Royal Navy have been justly noted for centuries for their knowledge of seamanship; they have had a contempt for the work of engineers and artisans. In consequence of this fact when steam machinery commenced to be installed in their ships, about 50 years ago, it was turned over to a new corps as something unworthy of attention. The spirit has continued almost to the present date, and meantime machines of marvellous ingenuity and great complexity have been installed in modern fighting-ships from one end to the other. The executive branch finds that a knowledge of handling a ship under sail is no longer needed; the engineer branch find themselves overburdened with work, since besides steam machinery they have confided to their care all mechanical gun carriages and mounts, the intricate and delicate machinery of the mobile torpedo, dynamos, and their appurtenances, hydraulic appliances for moving guns, turrets, etc.

"A modern ship of war is one of the most complicated machines in existence. It is filled with machinery of various sorts from one end to the other. The finished ship, ready for service, is of great cost and enormous value to the Government. It is worth nothing unless efficiently handled, cared for, and kept in readiness for service. These duties devolve upon sea-going officers. Sea-going officers must operate, keep in order and repair the immense number of living parts of a huge battle-ship. In intricacy they compare with the arteries, veins, sinews, and other parts of the human body. Is it expected that officers and men, who when placed on board of such a ship make their first acquaintance with the vast number of machines and moving parts now found there, can understand them? Is it expected they will know how to manipulate them, if they are without previous experience in their construction? It requires no professional experience to decide such a question. A great proportion of the repairs demanded on the interior parts of cruising-ships arise from a want of knowledge on the part of those who manipulate them.

"The only possible way that these ships can be kept efficient is for the officers and men who go to sea in them and who are responsible for their efficiency, to obtain previous knowledge of those internal fittings by supervising their construction and

installation, and thereby becoming familiar with their intricate character. The best engineers found on board of the modern ocean greyhounds are those from the shops of Glasgow and other great shipbuilding plants. The best locomotive driver is the one who has built his engine and knows every screw, every rivet, and every part in it. There is, therefore, no doubt that all interior moving mechanism actuated by steam, compressed air, hydraulics, or electricity, should be constructed and installed under the supervision of sea-going officers.

"I believe that all sea-going officers should spend a considerable amount of their time on shore learning the integral parts of the huge and costly machine placed in their hands when at sea, and which they must fight and maintain in an efficient condition.

"I further believe it to be in the interest of the country to increase the number of officers of the Navy sufficiently for this purpose. Professional knowledge is constantly required in the construction and equipment of a ship of war. Engineering knowledge is also constantly required of officers when at sea, in order to successfully manipulate the great number of appliances on board. There is no body of men in the country possessing the scientific attainments of naval officers who are paid such small salaries, and, therefore, the proposition should commend itself on the score of economy.

"The inspection of much of the machinery of battle-ships and armoured cruisers is now in the hands of the old officers formerly of the engineer corps who will soon be retired. It is my deliberate opinion that a corps of young Line officers should be assigned to duty as their assistants without delay."—*Army and Navy Journal.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS FOR NOVEMBER, 1902.

Colonel J. E. W. S. Caulfeild from Colonel on the Staff commanding the troops in Sierra Leone to be Colonel on the Staff to command the troops in Jamaica. General H.R.H., G. F. E. A., Prince of Wales and Duke of Cornwall and York, K.G., K.T., K.P., G.C.M.G., G.C.V.O., Colonel-in-Chief Royal Welsh Fusiliers and Royal Marines, to be Colonel in-Chief of the Queen's Own Cameron Highlanders. Major-General and Hon. Lieut.-General G. E. Baynes to be Colonel of the King's (Liverpool Regiment). Colonel F. G. Graves from h.p. to be a Colonel on the Staff to command the troops at Sierra Leone. Lieut.-Colonel A. J. A. Wright, C.B., from the East Lancashire Regiment, to be Colonel to command the 15th Regimental District (the East Lancashire Regiment). Brevet Colonel E. G. Grogan from h.p. to be Colonel to command the 42nd Regimental District (the Black Watch, Royal Highlanders).

The under-mentioned temporary appointments are made to the Staff in South Africa, viz.:—To be Lieut.-General on the Staff: Lieut.-General the Hon. N. G. Lyttelton, K.C.B. To be Major-Generals on the Staff: Major-General Sir H. H. Settle, K.C.B., D.S.O., R.E.; Major-General R. S. R. Fetherstonhaugh, C.B.; Major-General L. J. Oliphant, C.B., M.V.O.; Colonel (local Major-General) R. A. P. Clements, D.S.O., A.D.C.; Brevet Colonel (local Major-General) T. E. Stephenson, C.B. To be Brigadier-Generals on the Staff, with the local rank of Brigadier-General whilst so employed: Brevet Colonel C. F. Burn-Murdoch, C.B.; Brevet Colonel C. J. Blomfield, D.S.O., the Lancashire Fusiliers; Brevet Colonel W. R. Kenyon-Slaney.

To command Second-Class Districts in India with the temporary rank of Brigadier-General whilst so employed :—Brevet Colonel J. S. Collins, the Queen's (Royal West Surrey Regiment); Colonel J. H. S. Craigie, an A.A.G., Army Head Quarters; Brevet Colonel F. H. Plowden, the Oxfordshire Light Infantry.

Colonel R. A. Montgomery, C.B., from D.D.G. of Ordnance at Head Quarters to be a Major-General on the Staff for Royal Artillery. Brevet Colonel C. H. Collette from h.p. to be Colonel to command the 53rd Regimental District (the King's Shropshire L.I.). Major-General H. C. O. Plumer, C.B., to be a Brigadier-General on the Staff to command an Infantry Brigade, Ist Army Corps. Colonel E. T. Dickson from h.p. to be a Colonel on the Staff to command the troops at Barbados, with the local rank of Brigadier-General whilst so employed. Lieut.-Colonel and Brevet Colonel J. S. S. Barker from R.A. to be an A.A.G., with the substantive rank of Colonel in the Army. Lieut.-Colonel C. T. E. Metcalfe, from the Rifle Brigade (the Prince Consort's Own), to be a Colonel on the Staff to command the troops at Mauritius, with the substantive rank of Colonel in the Army and to have the local rank of Brigadier-General whilst so employed.

FRANCE.—*Disappearing Guns.*—In former times ships of war were not anxious to engage in a contest with coast forts and batteries, since, being constructed of wood, they could only get the worst of it. It was for this reason that, during the First Empire, the numerous English fleets, although mistresses of the sea and capable of attempting attack after attack upon the French coast, nevertheless abstained therefrom. Napoleon, in fact, had bestudded the maritime frontiers with numerous defences capable of making the enemy repent of his aggressions. There came a time, however, when ships seemed to assume a pre-eminence over coasts, and this was when they were provided with an armour that almost perfectly protected them against the effects of projectiles, although it is true that at that period coast batteries were furnished with guns that were inadequate and, for the most part, old-fashioned.

At present, such is no longer the case. Coast fortifications are now provided with guns which, if not equal to those that constitute the armament of vessels, possess at least a power fully sufficient to put the latter *hors de combat*. Moreover, the accuracy of firing is not the same with the ship and the coast guns, the advantage being entirely on the side of the latter. The regulation of the firing from land has even made such progress that it may be asserted that a vessel happening to try its mettle with a coast battery would be struck by the third shot at the least, and continue to be struck by the succeeding ones. So it may be said that the contest between marine gunners and coast artillerymen has finally returned to the point where it was a century ago ; that is to say, wholly to the advantage of the latter.

Such superiority of the land over the sea is capable of being still further increased by various arrangements, and, among these, the best, undoubtedly, is that whereby the gun is concealed from the sight of vessels. What sort of a shot, in fact, can the latter direct against an invisible target, without any data for effecting the corrections that are always necessary ? Now, there are two kinds of batteries that realise the conditions of fighting without being seen. There are, in the first place, underground mortar and howitzer batteries that fire indirectly at wide angles, and, in the second, disappearing gun batteries. In the first, the guns remain wholly invisible, and their firing, which is done at wide angles, is necessarily imperfect. In the second, the piece appears only just at the instant at which it is fired, and then immediately disappears ; and with the use of smokeless powder it would be almost impossible for ships to determine the position of the battery that fired the shot. Even should they succeed in obtaining a

glimpse of the gun during the short interval of its appearance they would hardly be any better off.

Disappearing guns, then, are formidable weapons, and the more so in that they fire direct shots which are capable of striking a vessel at the load water-line and consequently of sinking her. Among the most remarkable guns of this kind may be mentioned the one recently constructed by Messrs. Schneider & Co., which we illustrate herewith.

This gun is of 10·5-inch bore ; its length is 25·19 feet ; and its weight is 48,477 lbs. The breech block is of the Schneider-Canet type, with plastic obturator, the opening and closing of which are effected by turning a crank.

This weapon has a chamber-length of 28 calibres. The initial velocity of its projectile is 2,198 feet, which is quite sufficient for a coast gun using a 475-lb. shell. The charge is 90 lbs. of smokeless powder.

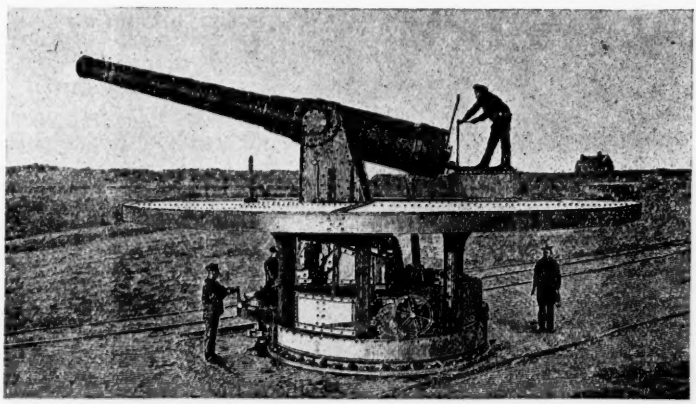


FIG. 1.—SCHNEIDER 10·5-INCH DISAPPEARING GUN IN BATTERY.

The gun is carried by a strongly crossed-braced "rocker," which oscillates around a rotary axis formed of two trunnions that support the brackets of the frame-platform. This latter receives all the parts of the carriage, which consist of the cylinders of the brake and of the air recuperator, the pointing devices, and the pump for putting out of battery. It rests upon the bolster through the intermedium of a circle of rollers and supports, by means of a number of uprights, the horizontal circular mask. This latter is provided with a longitudinal aperture designed to give passage to the gun in the disappearing and returning to battery motions.

To the rocker is secured the piston rod of the hydraulic brake, which has a counter rod that absorbs a portion of the live force of the recoil. The brake cylinder is capable of oscillating around two journals carried by the iron plate floor through the intermedium of two pillow blocks. In the rear of the brake cylinder is situated the air recuperator that assures the return to battery.

The upward pointing of the gun is obtained by acting upon a jointed rod that sustains the rear end of the piece. The pointing sector is controlled by a crank, and an index that moves over a dial permits of reading at every instant the exact angle made by the axis of the gun with the horizontal.

The pointing in direction is obtained by making the platform, rocker, and gun as a whole turn upon the bolster. In normal service, the direction of the piece is given in the complete disappearing position; but, since it may be necessary to rectify the pointing, even after the gun has returned to battery, the mask is provided with a special platform that permits the gunner through the breech sight to aim directly at the object to be fired at.

The amplitude of the vertical pointing extends from $+15°$ to $-5°$. As for the amplitude of the lateral pointing, that extends over an entire revolution so as to permit of sweeping every point of the horizon.

The weight of such an affair is not as great as might be supposed at first sight. The gun (as has been stated) weighs 48,477 lbs., the carriage 95,270 and the mask 39,600, say a total of 183,347 lbs.

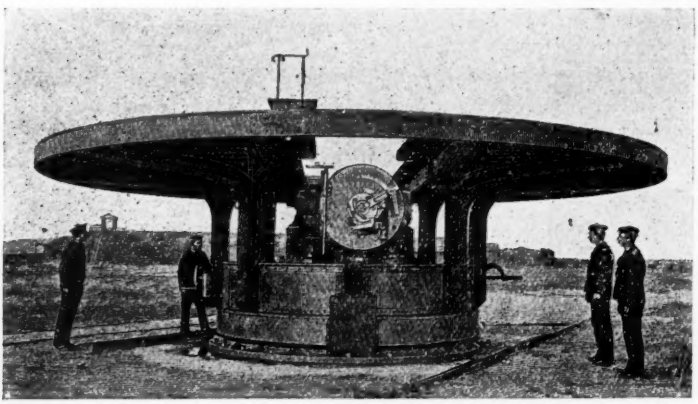


FIG. 2.—THE GUN AFTER FIRING.

As the advantages of their eclipse gun, Messrs. Schneider & Co. enumerate the following:—First, its power is sufficient to permit it to do battle at a great distance with heavily armoured vessels. Second, the complete protection that its mask assures it places it under very advantageous conditions for prolonging a contest. Third, as the gun disappears after every shot and the use of smokeless powder does away with a cloud of smoke that might attract attention, the enemy will find it very difficult to discover the sight of the battery. Fourth, the well-directed shots of the enemy will produce but little or no effect, since they will reach the horizontal mask with too slight an inclination to perforate it. Fifth, since the personnel and entire mechanism are placed beneath the mask, the gun will be able to keep up a lengthy contest without sustaining any serious loss or damage.—Translated for the *Scientific American Supplement* from *La Nature*.

UNITED STATES.—*Report of the Adjutant-General.*—The report of the Adjutant-General of the Army, Major-General H. C. Corbin, for the year ending 30th June, 1902, describes the process by which the Army is to be reduced in accordance with recent orders. The commanding general, division of the Philippines, has been instructed by telegraph to transfer, between this and 1st December, from the cavalry and infantry to

the artillery and engineers, men who are fit and willing in sufficient number to bring them up to the authorised strength, and to discharge men to the extent of 2,000 in the following order: those discharged for the good of the Service, those out of condition, men in the last year of enlistment who do not intend to re-enlist, and finally, deserving men not in the last year of their service who have urgent reasons for asking a discharge. Similar instructions have been given to the department commanders. This should leave in the Army a sufficient number of fit and contented men. The enlistments for this month, November, will be limited to the artillery and engineers. On 15th October, 1902, there were 3,586 officers and 66,003 men in the Army, besides the Hospital Corps, the Porto Rico Regiment, the Philippine Scouts, and the 12 volunteer medical officers; in all 311 officers and 9,416 men.

The total number of losses in the Army during the year ended 30th June, 1902, was 47,727, as follows:—

Officers: killed in action, died of wounds or disease, etc., 35; resigned, etc., 21; retired, 68—124.

Enlisted men: killed in action, died of wounds or disease, etc., 1,227; discharged upon expiration of service, 35,806; discharged for disability, by sentence of court martial and by order, 5,698; deserted, 4,667; missing, 2; retired, 203—47,603. Total, 47,727. Seventeen officers and 172 men were wounded.

Of the 1,740 appointments of officers made since 1st January, 1898, as shown by the following table, 276 were of graduates of the Military Academy, 376 were of enlisted men of the Army, 477 from civil life, and 615 from ex-officers and enlisted men of volunteers. All appointments were made to the grade of second lieutenants, except 216 of those made from ex-officers and enlisted men of volunteers, which were to the grade of first lieutenant—65 in the cavalry, 82 in the artillery, and 69 in the infantry.

There are in the ranks 19,181 men who have served more than three years and 4,682 of five years' service, and over. In the Philippines are 1,039 officers and 21,396 men. The total serving there since the beginning is 74,534 regulars and 47,867 volunteers. Of these, 1,135 officers and 23,000 men have served there more than once. The maximum strength in the Philippines has been 69,426 and the average strength about 40,000.

The casualties from 30th June, 1898, to 7th July, 1902, were as follows:—

	Regulars.		Volunteers.		Total.	
	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.
Killed	32	353	22	388	54	741
Died of—						
Wounds ...	10	96	7	129	17	225
Disease ...	26	1,673	21	1,028	47	2,701
Accident ...	2	96	4	38	6	134
Drowning ..	2	202	4	61	6	263
Suicide ...	3	58	6	15	9	73
Murder or homicide ...	1	69	—	28	1	97
Total deaths ..	76	2,547	64	1,687	140	4,234
Wounded ...	71	1,165	133	1,653	204	2,818

In this are included 18 enlisted men killed; 1 officer and 14 enlisted men died of wounds: 2 officers and 174 enlisted men died of disease, etc., and 11 officers and 100 enlisted men wounded during the war with Spain, or up to 4th February, 1899.

The total contacts with the enemy between 4th February, 1899, and 4th July, 1902, were 2,811. The larger proportion of these fights were attacks from ambush on the American troops. In almost no case in these engagements did American troops surrender or retreat or leave their dead and wounded in the possession of the enemy, notwithstanding that in many cases the percentage of loss was high.

The number of killed of the enemy was in many cases estimated. As a rule, no estimate was made in reports of the enemy's wounded. His wounded, and often his dead, were carried off before the Americans occupied the hostile positions. The killed of the enemy being, as a rule, overestimated, and the wounded not reported, by the Americans, gave rise to an erroneous impression that the wounded were dispatched, which never happened.

The Adjutant-General gives some account of the present condition of the Military Academy. Discipline during the year has been highly satisfactory, and a much desired revision of the curriculum has been made as the result of the abolition of the long existing restraint of an entrance examination rigidly fixed by law. 1,111 cadets have been admitted without a mental examination upon certificates of efficiency granted by various institutions of learning and three as the result of competitive examinations. These young men will be carefully watched, with a view to determining as nearly as possible whether satisfactory material is obtained in this way. It is the intention, also, in case any cadet so admitted is found deficient in the first six months of his course, to invite the attention of the school or college official to the fact, in the hope that such action will result in a closer touch between the Academy and the general school system of the country, and a certification of only such young men as are preeminently qualified to master the curriculum and become officers of our Army. In this way the Academy will become a greater factor in the educational system of the country than has been the case in the past.

General Corbin says:—"The necessity for preparing the graduates for all branches of the Service is even greater now than ever before, owing to the method of filling appointments to the staff corps by detail from the line. In connection with the relative employment of the entire time of a cadet while at the Academy, it is pertinent to remark that the length of the academic year at West Point, together with the small number of holidays, makes the course of four years almost as long in actual working time as five years of the ordinary college course of thirty weeks. The academic year at the sister Academy at Annapolis is also several weeks shorter than ours."

The Military Information Division has done much useful work during the year and has almost entirely removed the congestion resulting from the withdrawal of its officers during the war with Spain. The carding and indexing of the vast amount of information received in the division from various sources has been resumed in a systematic and practical manner. In reply to requests, a large amount of data on various military subjects has been furnished to the different bureaus and offices of the War Department, to officers of the Army, preparing lyceum essays, lectures, etc., to the service schools, to the National Guard, and to individuals. It has been specially the aim of the division to afford all possible aid to officers of the Army in prosecuting their professional studies.

An arrangement has been made with the Chief Intelligence Officer of the Navy for an exchange of information. In the map section, a large scale map of the entire

Philippine Archipelago has been nearly completed. A map showing the army stations has been published and distributed to the Army. An outline map of Porto Rico, prepared by the division, is pronounced the most satisfactory one in existence.

The first volume of a series of war atlases, entitled "Scenes and Incidents connected with the War between the United States and Spain," and consisting of a pictorial history of the war from photographs taken at the scenes of operations, has been completed for the records of the war between the United States and Spain. The second volume is now ready for binding. The third volume is 75 per cent. completed. Work on these atlases has been carried on only at times when other work was not pressing, and progress has, therefore, been slow. The photographic establishment has not only proved indispensable to the expeditious accomplishment of the work of this character of the Adjutant-General's Department, but has also performed a large amount of similar work for the other bureaus and offices of the War Department, it having been at their service at all times. It has also at times assisted other departments of the Government.

While the number of military attachés abroad has been reduced, the character and quality of the information received from that source have continued to improve.

Attention is again invited to the recommendation containing several preceding annual reports for increased rank and pay of our military attachés abroad.

In regard to the militia of the several states and territories, letters of instructions were sent to the officers detailed to attend the encampments, and their reports, when received, are examined and prepared for publication, should that be considered desirable. Such publication is not recommended this year however, as but a small percentage of states have been heard from. The reports thus far received from officers of the Army detailed to attend state encampments indicate general interest, zeal, and good work on the part of the National Guard, and state that marked improvement was shown during the encampments.

An account is given of the plans for the instruction of officers which have been outlined in the orders we have published. In the post exchanges the receipts for the year have been $1,124,542·50 as against $2,123,077·29 last year. The profit was $235,644·52 of which $138,832·39 was expended for the benefit of the soldiers and $86,252·57 put by as a reserve fund. The assets over liabilities are $249,303·92 as against $353,768·40 on 30th June, 1901.

Of the 37,461 accepted recruits for the Army, 32,249 were native born, 4,726 of foreign birth, and 486 were born in Porto Rico; 34,677 were white, 2,284 coloured, 14 Indians, and 486 Porto Ricans. The enlistments numbered 26,026 and the re-enlistments 11,435. The rejected applicants were 871,081, or 70 per cent. of the whole. Natives to the number of 4,079 were enlisted for the Philippine Scouts. Including these and the Hospital Corps, the total of enlistments was 42,775.

An account is given of the combined Army and Navy manœuvres. These have proved that the rank and file of our Army can be depended upon in every emergency; that apparently impossible tasks can be accomplished under the spur of necessity, and that there is an immeasurable gulf between practice and theory. The lessons learned by both officers and men were of more practical value than years of ordinary garrison routine and instruction. It is strongly recommended that similar exercises be conducted annually and made to embrace each year a new theatre of operations, so that the benefit may be shared by the different garrisons in the several fields of defence. A corps of artillery experts is necessary to embrace steam engineers, machinists, and electricians. Such a corps could readily be organised by expanding the detachment of post electrician sergeants to not less than 400, changing the name, and classifying the

men in three grades, the highest of which to receive not less than $75 per month, and the intermediate grade $50. As this corps is intended absolutely for coast artillery, it should be made an integral part of the artillery arm, the men composing it to be assigned as directed by the Secretary of War. Some account is also given of the recent manœuvres at Fort Riley. It is noted that with the exception of less than 4,000 United States magazine rifles, calibre ·30 (the arms in the hands of the regular infantry), the present armament of the several National Guards embraces five different kinds of obsolete rifles, viz., the Springfield (two calibres), the Lee, the Winchester magazine, the Krag-Jorgensen, and the Remington-Lee magazine.

A summary of recommendations and remarks on subjects of interest affecting the Army, collected from the annual reports of department commanders and their general staff officers, is submitted. They will be found in the reports we have already published.

The Adjutant-General recommends the promotion of officers on retirement. He advises young officers not to marry, as they should have but one allegiance, and that to the Service, recommends that officers be allowed to deposit their savings with the Government at 4 per cent., that $12 per room be allowed for commutation of quarters and that one room be added to the present allowance. A post graduate course in French, German, and Spanish should be provided.

In conclusion, General Corbin says: "The restoration of the exchange as it existed prior to the passage of the Act of 2nd February, 1901, prohibiting the sale of beer, is desired and urged by the great majority of officers and men and by none more than those of pronounced temperance views. Numerous reports confirm the views long held by this office that the old exchange contributed to sobriety, health, and contentment of the men. The increase of desertions and of trials for infractions of discipline is, by those best informed, attributed to the abolition of the former privileges of the exchange.

"The instruction of our men in vocal music would be a step in the direction of contentment and better discipline. Every regiment should have its marching song. Frequent practice in singing, particularly during the long winter evenings, would do much to make our men satisfied to remain in quarters and away from the baneful influence of the bar-rooms that exist in too great numbers in the vicinity of all our military posts. These bar-rooms are under the protection of the license and laws of several states and are beyond the control of the military authority.

"The detail-staff system works to the entire satisfaction of the department. The more a scheme for a general staff is studied, the more convinced I become that it offers the best solution of the vexatious friction with which you and your predecessors have had to contend for many years. It is recommended that it again be brought to the attention of Congress and early action taken in the interests of the Service."

Army Ordnance Work.—The report of Brigadier-General William Crozier, Chief of Ordnance, U.S.A., is an intelligent and methodical statement of the work and needs of his Department, which is more impressive than so much rhetoric would be. The business attending the expenditure of $8,792,964·24 during the fiscal year has suffered embarrassment because of an insufficiency of clerical force. Many valuable clerks in the lower grades resign to accept other positions at increased salaries, the limited number of the higher-grade clerkships in this office offering no prospects for promotion. The professional work of the Department is crippled by the unwillingness of line officers to accept a detail to it, to which we have referred heretofore. To lower the standard in order to attain officers is not advisable. To detail officers without exam-

ination would have the same result, as it would not only cause the loss of the certain guarantee of standard attainment and of all the additional superiority resulting from competition, but would place in positions requiring the closest application and the intense interest of the devotee officers having problematical liking for the work, and without the stimulus indispensable for the successful pursuit of the engineering profession. It would also eliminate the very useful general review of student courses which the preparation for examination entails, and for which there is no time after entering upon the duties of the Department. To lower the standard would be to abandon the position which has been held since the formation of the Department—that special aptitude and technical skill are required in the establishment and production of the weapons which the Army is to use in war.

There remains the third possibility, viz., that of permitting the attainment of a temporary advance of one grade by Ordnance service and by providing for greater permanence of duty in the Ordnance Department so that such duty may become practically the life work of the officer. "It is recognised that efficiency as an ordnance officer will be increased by occasional service with troops, but the principle should be followed of regarding such service as an incident of the practice of the profession of the ordnance engineer, rather than to attempt such practice as an incident of service in the line."

General Crozier reports that 866 condemned cannon and 11,752 projectiles have been distributed during the year to posts of the G.A.R., to monumental associations and municipal corporations. The Gathmann gun has been tried and found wanting, the cost of the trial being $135,062·60. The improved musket, which was referred to in the last report of the Chief of Ordnance as being under construction, has been completed and tried, with very satisfactory results. The principal elements of the new piece in comparison with those of the present Service rifle are contained in the following table :—

——	Springfield.	Service rifle.	Mauser.	German military rifle.
Calibre ... ... inch	0·30	0·30	0·275	0·311
Rifling				
Number of grooves, ...	4	4	4	4
Depth of grooves, ... inch	·004	·004	·0049	·004
Twist, one turn in ... inches	10	10	8·66	9·45
Weight of bullet ... ... grains	220	220	173	226·82
Weight of charge ... ... ,,	43·3	37·6	38·58	41·2
Weight complete cartridge ... ,,	451·15	438·85	385·63	430·24
Initial velocity ...feet per second	2300	2000	2200	2145
Velocity at 1,000 yards	958	901	895	906
Muzzle energy ... foot-pounds	2581·6	1952	1857·4	2315
Striking energy, 1,000 yards ...	447·9	396·2	307·4	413
Penetration in white pine, 53 feet ... . inches	54·7	45·8	50·8	—
Weight, including bayonet and scabbard .. ... pounds	9·47	10·64	10·5	11·54
Weight, 100 cartridges ... ,,	15·91	16·91	16·18	17·68
Capacity magazine ... ... rounds	5	5	5	5
Maximum ordinate of 1,000 yards trajectory ... ... feet	20·67	25·8	24·47	23·37

In the coming spring 5,000 of the new muskets will be distributed for trial. Automatic muskets are the next step in progress, but no rifle in this class has been

presented to this Department for examination and test, although its willingness to take the subject up has been signified whenever occasion has offered.

The Rock Island Armory, when completed, will manufacture 250 muskets per day of eight hours, and the full product of Springfield is 400 more, or a total of 650. It would require about two and one-half years for the two armories working at their full day capacity to produce the 500,000 new rifles required for a proper reserve and about eight years working at the present rate. In case of emergency, both establishments could be operated upon the basis of a twenty-hour day, and under these circumstances would be capable of a daily output of 1,500 rifles, which in three months, after the necessary workmen should have been secured, about the time necessary for assembling a volunteer force, would provide 135,000 arms.

The powder for the calibre ·30 rifle had been furnished almost exclusively by the Laflin and Rand Powder Company, Pompton Lakes, N.J. This powder has been of excellent quality, more than fulfilling the requirements of the specifications. These requirements will be more rigid than last year. An interesting account is given by General Crozier of the work of procuring a proper powder supply.

Very interesting and, on the whole, very favourable reports have been received from Springfield Armory and Fort Thomas on the reduced range cartridges, but decision as to the adoption of the cartridges is awaiting reports from the remainder of the posts. About 20,000 detonating fuses for siege and seacoast shells are being manufactured, using the stock on hand. A novel form of time fuse, which promises to surpass the best foreign fuses in efficiency, is now being developed at this arsenal, and it is hoped that the manufacture of them in quantity can be undertaken during the coming fiscal year. In the meantime, steps will be taken to provide the Service with satisfactory fuses from wherever they can be obtained.

An account is given of a competitive test of eight systems of field guns, all using fixed ammunition, which has been fully reported here. It is observed that only two systems, the Ehrhardt and the Ordnance Department long-recoil are reported to have passed the tests in a manner not unsatisfactory. As to these, certain defects and undesirable features are noted by the Board. The Department is now proceeding with the manufacture of field material from designs which it has prepared concurrently with the development of knowledge by the tests. The new gun will have a calibre of 3 inches, and will fire a projectile weighing 15 lbs. with an initial velocity of 1,700 feet per second. The breech mechanism will be of the type used with the Ordnance Department gun in the tests, with a modification for insuring greater safety. The development of the field material entered for the tests by this Department is perhaps its most satisfactory piece of work for the year. The credit is principally due to Captain Charles B. Wheeler, O.D., who is responsible for the gun and carriage. Several mountain guns and carriages have been tested by the Department during the year, but none have shown themselves superior to those of the Vickers-Maxim system now in the Service, and the manufacture of these is being continued. A new carriage for the 7-inch howitzer has been built and tested. It differs from the former design principally in having the piece mounted at a height of 5 feet, instead of 6 feet above the ground; this for the purpose of increasing the stability when upon the march. Experiments are in progress at Sandy Hook to determine a design for large capacity shells for siege pieces, to be used with high-explosive bursting charge.

Two systems of electrical control are being tried with eight 12-inch disappearing carriages at four widely separated posts the desirability of using some system having been abundantly demonstrated. Efforts are also being made to increase the rapidity of fire from all sea-coast guns by the application of automatic or semi-automatic

appliances for opening and closing breech mechanisms and by the use of special devices for ramming projectiles and inserting powder charges. Tests recently made and reported by us have conclusively demonstrated the value of the disappearing guns. It is hoped to remedy the defect in the gas-check pad developed by these trials. Each Artillery post is to be furnished with one sub-calibre tube for each calibre and mould of the gun. The manœuvres furnished such a test as none of our seacoast material has ever before been subjected to and no weakness was developed in the guns except in the gas-check. The gun carriages survived the test without the least symptom of weakness, and at the conclusion were in perfect condition for an indefinite continuance of their service. It is found, however, that the system of furnishing each company of Artillery with two mechanics is not a success. The pay is too small to secure proper men ; it should be increased, even if the extra expense requires the reduction of the number to one per company.

Instead of an acting Ordnance officer at each Artillery post there should be one for each Artillery district on the staff of the District Commander, the Post Ordnance sergeants being left in charge of the stores. The Staff Ordnance officers should be relieved of most other duties to enable them to study carefully the requirements of the district, and to see that it is properly supplied with ordnance material.

It is expected that nickel steel will be adopted for guns of large calibre. A sufficient reserve of smokeless powder has been obtained and its manufacture continues at few private establishments. The seacoast mortars have proved a great success, and our heavy armament, though not complete, is in a satisfactory state of progress. The rapid-fire armament is not so well advanced as the heavier. The 16-inch gun is a success and is soon to be tried.

The Manila Ordnance Depôt has proved an important auxiliary, greatly facilitating the settlement of officers' accounts, the corrections of errors and the adjustment of misunderstandings.

The battalion of the First Regiment of Massachussetts Artillery, which formed the temporary garrison of Fort Rodman during the Army and Navy manœuvres, comes in for a well-deserved compliment from the Chief of Ordnance in his annual report. General Crozier says : — "The personnel of this regiment is composed largely of engineers, machinists, and electricians, who bring to their duties very valuable knowledge of mechanical details, and who, starting with this extremely desirable equipment, and having to learn only the military duties of a garrison soldier, are believed to be capable of being quickly transformed upon occasion into an effectual addition to the peace-time garrisons of the fortifications."

Report of Chief Signal Officer, U.S.A.—Brigadier-General Adolphus W. Greely, Chief Signal Officer, U.S.A., deals at length in his Annual Report with the development of the telegraph systems under his direction in Alaska, Cuba, and the Philippines. In Alaska there have been established and placed in working order 1,121 miles of land lines and submarine cables in the last two years. "The accomplishment of such results," says General Greely, "would be most creditable to officers and men concerned therein, if Alaska was an ordinary country, for this work included, not only surveying, construction, and installation of this length of line, but also involved the manufacture and inspection of enormous quantities of material, instruments, etc., many hundred tons in weight, and their transportation over distances ranging from 4,000 to 7,000 miles. When one considers, however, the exceedingly difficult physical conditions within the territory, the work must be considered simply phenomenal. In all parts of Alaska traversed by this great length of line there are not a dozen miles of wagon road.

The region through the Tanana Valley, where hundreds of miles of wire have been laid, is marked upon most charts as an unexplored region, and there was in existence, until reconnaissances were made by Signal Corps officers, no accurate maps of the Valley. In line building, all transportation, apart from the Yukon River, has been by pack animals. On the Valdes section all the wire, insulators, nails, etc., have been carried on mules' backs, some of it a distance of 100 miles, and great quantities distances of 50 miles or more."

Upon the expiration of the U.S. military occupation of Cuba, on 20th May, 1902, General Greely turned over to the civil government 3,500 miles of telegraph lines extending throughout the island and connecting all its principal towns and seaports. The service has been greatly improved, modern instruments have been installed and the system is a source of large and increasing revenue to the Cuban Government.

The telegraph and cable system of the Philippines on 30th June, 1902, consisted of 6,434 miles of line, an increase of 2,600 miles over the year preceding. In addition to this about 3,000 miles of temporary lines were provided for military columns and their bases. On entering the Philippines the U.S. Army found virtually no telegraph lines in existence. There are now eleven officers of the Signal Corps and two detailed officers of the line on duty in the Islands. One fourth of the whole number of the officers of the Signal Corps are to-day disabled from Philippine service. The effort to replace these officers from the line has been practically a failure, despite the cordial co-operation of the Secretary of War, who has approved every recommendation of the Chief Signal Officer of the Army in this respect, and of the Major-General commanding the Philippines, who has likewise exerted his good offices in vain. The Secretary of War directed the detail of four competent line officers from officers serving in the Philippines, but only two such could be obtained: General Chaffee cabling that it was impossible to obtain suitably qualified officers for the work.

General Greely strongly urges the construction of a Pacific cable under the complete control of the Government. The importance of an alternate route between the Philippine Islands and the Asiatic coast has been strongly emphasised by the interruption to the Manila-Hong Kong cable in June, 1901, which fortunately lasted only ten days. It is a matter of grave importance that a second route should be obtained either by an all-American Pacific cable or by connection with Borneo or Japan.

The system of wireless telegraphy devised by the Signal Corps in 1899, with which messages were transmitted between Fire Island and Fire Island Light has been improved in details and installed more than two years since in San Francisco Harbour, has worked satisfactorily the entire time, except for a few hours needful to replace broken parts. This is believed to be the longest record of satisfactory working between any stations, and it has been done not by highly-paid experts, but by the enlisted men of the Signal Corps, whose skill and intelligence are worthy of commendation.

In view of the depleted condition of the Signal Corps, in both officers and men, General Greely recommends that the commissioned force be increased by the addition of one colonel, two lieut.-colonels, one major, eight captains, and eight first lieutenants, and the enlisted force by the addition of 100 first class privates and 50 privates.

The estimates for the fiscal year ending 30th June, 1904, aggregate $549,000. This amount is divided as follows:—For the Signal Service of the Army, $160,000; for the installation and maintenance of Artillery Fire-control Service, $389,000. The estimate for the Signal Service of the Army is an increase of $20,000 over the appropriation for the fiscal year ending 30th June, 1903. This increase is necessitated as follows:—Extra expense for the maintenance and repair of 1,500 miles of military telegraph and cable lines in Alaska, estimated at $15,000. The remaining $5,000 is the

minimum extra expense involved in Army manœuvres and practice camps, which is the declared policy of the War Department for the benefit of the Militia of the country.—*U.S. Army and Navy Journal.*

CORRESPONDENCE.

CAPTAIN MAHAN, U.S.N., AND THE ROYAL UNITED SERVICE INSTITUTION.

[COPY.]

Royal United Service Institution,
Whitehall, S.W.
10th November, 1902.

SIR,—I have the honour to inform you that, at a meeting of the Council held on the 4th instant, you were, subject to your acceptance, unanimously elected an Honorary Member for Life of the Royal United Service Institution, in consideration of your valuable contributions to literature bearing on the Naval History of Great Britain.

I have the honour to be, Sir,
Your obedient servant,
R. M. HOLDEN.
Lieut.-Colonel, Secretary.

Captain Alfred T. Mahan, D.C.L., LL.D.,
United States Navy.

160, West Eighty-Sixth Street.
New York.
24th November, 1902.

SIR,—I have had the honor to receive your letter of the 10th instant, notifying me that I have been unanimously elected an Honorary Member for Life of the Royal United Service Institution.

It gives me very great pleasure to accept this election, and I beg that you will convey to the Council my thanks for the honor done me, and my very high sense of the terms of appreciation in which it has been pleased to speak of my contributions to the naval literature of the British Navy.

I have the honor to be, Sir,
Your obedt. servant,
A. T. MAHAN,
Captain, U.S.N.

Lieut.-Colonel R. Holden,
Secretary,
Royal U.S. Institution.

THE RETURN OF NAVAL PRIZE-FIRING FOR 1901.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—Would you allow me to point out that in Naval Notes in the number of the JOURNAL of the Royal United Service Institution dated 15th September, 1902, the writer of the *Times* analysis of return of the naval prize-firing for 1901 is somewhat unfair in his criticisms of the shooting of the Navy? This may be due to the form in which the Admiralty return is made out. I cannot be certain on this point, never having seen the return; but an expert of such eminence should surely be capable of drawing fair conclusions from the premises provided by the Admiralty.

To give some instances:—The *Times* expert, criticising the shooting of the 6-inch B.L. guns, says:—"But if high results cannot be expected from the gun, the averages of the three years do not indicate improved training." Such trifling differences in the numbers of hits per gun per minute may be entirely due to weather or to the wearing of the guns, and there is probably no deterioration in the training, as is more than hinted at in the *Times* expert's remarks. Moreover, it is hardly natural to expect that there will be much improvement in the training of such a relatively unimportant portion of the fleet as that constituted by the ships mounting the 6-inch B.L. gun, whereas it is evident that there is a considerable improvement in the training of that very important portion of the fleet constituted by the ships mounting the 6-inch Q.F. gun.

The same remarks apply to the criticism on the shooting of the 5-inch and 4-inch B.L. gun: moreover, the deterioration in the shooting of these guns, if any, may be due to the average size of the ships carrying these guns having decreased considerably of late years. Again, as regards the criticism on the firing of the 4·7-inch Q.F. guns, the percentage of hits per gun per minute is obviously brought down by the number of small craft carrying these guns. It is obvious even to the uninitiated that, other things being equal, the larger the ship the better gun platform she is, and the better the shooting from her guns. No doubt the Admiralty returns lump all craft together, but the firing of the torpedo-gunboats and other small craft carrying the 4·7-inch must bring down the average of the fleet as a whole immensely. What is the good of comparing the shooting of the "Jaseur" and "Barfleur," for instance? It is obvious that shooting results should be classified by the size of the ships mounting the guns concerned, as well as by the calibre of the guns. Then really fair statistics would be arrived at, much to the benefit of all concerned.

Yours truly,

H. E. G. CLAYTON,
Captain R.E.

On board H.M. Transport "Palawan,"
16th October, 1902.

NAVAL AND MILITARY CALENDAR.

NOVEMBER, 1902.

3rd (M.) 2nd Bn. Royal Berkshire Regiment, 1st Bn. Royal Dublin Fusiliers } Left Point Natal for Egypt and Malta in the "Dominion."

4th (T.) H.M. the King reviewed the 2nd Bn. Scots Guards on their return from South Africa.

" " 6th Brigade Division R.F.A., 1st Bn. Royal Sussex Regiment } Arrived at Bombay from Cape Town in the "Plassy."

5th (W.) 35th Brigade Division R.F.A. left Bombay for England in the "Syria."

6th (Th.) 2nd Bn. Royal Munster Fusiliers arrived at Queenstown, Ireland, from Cape Town in the "Orient."

7th (F.) 2nd Bn. Royal West Kent Regiment left Cape Town for Ceylon in the "Golconda."

" " "O" and "P" Batts. R.H.A., 1st Bn. Liverpool Regiment, 1st Bn. Leicestershire Regiment. } Left South Africa for India in the "Ortona."

8th (Sat.) H.I.M. the German Emperor reviewed the 1st (Royal) Dragoons at Shorncliffe.

" " The Hong-Kong Regiment arrived at Bombay from Hong-Kong for disbandment in the "Aratoon Apear."

10th (M.) 1st Bn. York and Lancaster Regiment arrived at Bombay from Durban in the "Oratava."

11th (T.) H.M.S. "Flora" commissioned at Devonport for Pacific.

" " 3rd Bn. Royal Warwickshire Regiment arrived at Bermuda from Malta in the "Staffordshire."

12th (W.) H.M.S. "Venerable" commissioned at Chatham for Mediterranean.

" " 2nd Bn. Royal Warwickshire Regiment left Bermuda for England in the "Staffordshire."

" " 1st Bn. Durham Light Infantry arrived at Bombay from Cape Town in the "Assaye."

" " 36th Brigade Division R.F.A. left Bombay for England in the "Plassy."

14th (F.) The Gazette announced that the British Government held the proclamation of blockade issued by Venezuela to be ineffective.

" " News received from Somaliland that Colonel Cobbe's column had reached Burao.

15th (Sat.) H.M.S. "St. George" paid off at Portsmouth.

" " Gennaro Rubino attempted to assassinate the King of the Belgians.

19th (W.) H.M.S. "Hogue" commissioned at Devonport for Channel.

" " 36th Company R.G.A., 2nd Bn. Royal Sussex Regiment } Left Bombay for England in the "Soudan."

" " Intelligence received from India of a sharp engagement with the Waziris.

" " Martial Law was abolished in the Transvaal.

20th (Th.) 1st Bn. Royal Dublin Fusiliers arrived at Malta from South Africa in the "Dominion."

" " 1st Bn. Royal West Kent Regiment left Malta for England in the "Dominion."

21st (F.) 2nd Bn. Royal West Kent Regiment arrived at Ceylon from South Africa in the "Golconda."

22nd (Sat.) 2nd Bn. Royal Welsh Fusiliers arrived in India from Hong-Kong in the "Wakool."

23rd (S.) Ottoman troops were withdrawn from the Aden Hinterland disputed territory pending decision of Delimitation Commission.

24th (M.) 2nd Bn. Royal Berkshire Regiment arrived in Egypt from South Africa in the "Dominion."

" " 2nd Bn. Leicestershire Regiment left Egypt for England in the "Dominion."

25th (T.) H.M.S. "Bacchante" commissioned at Chatham for Mediterranean.

" " H.M.S. "Thetis commissioned at Chatham for Pacific.

" " The British Arbitration Award was delivered to Chili and Argentina.

" " "B" Batt. R.H.A.
2nd Bn. Durham Light Infantry } Left India for England in the "Assaye."

" " "O" and "P" Batts. R.H.A.
1st Bn. Liverpool Regiment
1st Bn. Leicestershire Regiment } Arrived in India from South Africa in the "Ortona."

" " 1st Bn. East Lancashire Regiment left Cape Town for Ireland in the "Sunda."

" " 1st Bn. Duke of Cornwall's L.I. left Ceylon for South Africa in the "Golconda."

" " 35th Brigade Division R.F.A. arrived at Southampton from India in the "Syria."

26th (W.) H.M.S. "Venerable" left Sheerness for Mediterranean.

" " H.M.S. "Flora" left Plymouth for the Pacific.

" " Announced that the Expedition against the Waziris had successfully accomplished its object.

27th (Th.) Announced that General Manning had relieved Bohotle, in Somaliland.

28th (F.) H.M. the King of Portugal reviewed 1st Bn. Oxfordshire Light Infantry, at Chatham.

29th (Sat.) "C" Batt. R.H.A.
2nd Bn. York and Lancashire Regiment } Left India for England in the "Sicilia"

" " 2nd Bn. Royal Warwick Regiment arrived at Plymouth from Bermuda in the "Staffordshire."

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletin del Centro Naval.* Buenos Aires: October, 1902.—"Experimental Determination of the Curves of Gyration." "Inland Navigation in relation to other Means of Transport" (*continued*). "Combined Operations" (*continued*). "Luminous Reflectors in Naval War." "The Fiske Electrical System for Laying Guns." "The Gunner's Manual" (*continued*).

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. XII. Pola: December, 1902.—"The Training of the English Fleet for War." "A Suspended Apparatus for the Prevention of Sea-sickness." "Diving and Submarine Boats." "Foreign Naval Notes."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: October, 1902.—Has not yet been received.

FRANCE.—*Revue Maritime.* Paris: October, 1902.—"Submarines and the Naval Policy of England." "A Glorious Naval and Colonial Episode in the Wars for Religion." "Note on the Phenomenon of the Remarkable Phosphorescent Display observed in the Indian Ocean." "Shipwreck Statistics and other Maritime Disasters during 1901." "Foreign Navies."

November, 1902.—"Geometry of Diagrams" (*continued*). "A Glorious Naval and Colonial Episode in the Wars for Religion" (*concluded*). "Foreign Navies."

Le Yacht. Paris: 1st November, 1902.—"Naval Commissariat." "Yachting Notes." The First-Class Russian Armoured Cruiser 'Bayan.'" 8th November.—"Our Naval Constructions." "Yachting Notes." "The Mercantile Marine: French and Foreign." 15th November.—"The New 13,600-Ton Cruiser." "Yachting Notes." 22nd November.—"The Reduction in the Effectives in our First-line Squadrons." "Yachting Notes." "The Mercantile Marine." 29th November.—"The Reform in the Administration of the Navy." "Yachting Notes." "New Organisations of the Squadrons for 1903."

Le Moniteur de la Flotte. Paris: 1st November, 1902.—"Blockade." "Submarines and Submersibles." 8th November.—"The Pacific Cable." "The New Constructions." "Colonial Notes." 15th November.—"The Estimates for 1903." "The Navy in Parliament." "Sea-Service Roster for Capitaines de Frégate." "Trials of Torpedo-Boats." 22nd November.—"Japanese Views." "The Navy in Parliament." "Statistics for Shipwrecks and Maritime Disasters in 1901." 29th November.—"An English Opinion on Submarines." "Reconstructions." "The Navy in Parliament." "The Control of the Navy."

La Marine Française Paris: 1st November, 1902.—"The Dockyards and the Workman Question." "The Affair Raoul Pictet in Parliament." "The Question of the Engineers." "A New Proposal for the Increase of the Japanese Fleet." "The

Principal Want of the U.S. Fleet." 15th November.—"Au Pays des Gestes." "Military Engineering at Bizerta." "The Combined U.S. Naval and Military Manœuvres, 1902." "The Straits of Gibraltar and the Riverain Powers." "The Question of the Engineers." "The Naval Budget for 1903."

GERMANY.—*Marine Rundschau.* Berlin: December, 1902.—"Reminiscences of Admiral von Stosch." "The English Naval Manœuvres of 1902 in the Mediterranean." "The French Submarine-Boat Manœuvres off Cherbourg." "The Cruise of H.I.M.S. 'Falke' up the Amazon." "The first Armoured Ship built in Corea in 1592, and other Corean Inventions." "Four, or Five Places of Logarithms in Nautical Tables." "The Annual Report of the United States Navy for 1901-02."

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PORTUGAL.—*Revista Portugueza. Colonial e Maritima.* Lisbon: November, 1902.—"Intercourse between Flanders and Portugal, from 1094 to 1682" (*concluded*). "The Mozambique District in 1898." "Penal Transportation and Colonisation" (*continued*). "Foreign Naval Notes."

SPAIN.—*Revista General de Marina.* Madrid: December, 1902.—"The U.S. battle-ships 'Connecticut' and 'Lousiania.'" "The History of an Unused Dock-yard, Channels which are Silting up, and a Bay which is Disappearing." "The Decline of England as a Sea-Power." "Bizerta." "President Roosevelt and the Navy."

UNITED STATES.—*Journal of the American Society of Naval Engineers.* No. 3. Washington: August, 1902.—"Recent Investigations Concerning Dynamical Action in Shafting of Marine Engines." "Contract Trials of Torpedo-boat Destroyers 'Paul Jones' and 'Preble.'" "Electric Transmission of Power for Navy Yards." "Contract Trial of Torpedo-boat No. 25." "Submarine Torpedo-Boats." "Report of the British Admiralty on Naval Boilers."

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AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna: 1st November, 1902.—"Service Bill." "The War School Jubilee." 9th November.—"The Officer in Parliament." "The New Military Rescript." "The New Musketry Instructions." 17th November.—"Immunity and Court of Honour." "The Development and Efficiency of French Artillery Guns." "Paper Chases." 25th November.—"Winter Employment." "The Field-Gun Question." "A New Promotion Regulation for the French Army."

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: November, 1902.—"Computation of Universal Shooting Tables, and their Use in the Solution of Examples in Musketry Instruction" (*concluded*). "Solution of Various Problems arising from the Weight-carrying Capacity of Different Substances."

Organ der Militär-wissenschaftlichen Vereine. Vienna. Vol. LXV., Part 4.—"A Plevna of the Present and of the Past." "The Independence of Subordinates according to Karl Bleibtreu."

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Le Spectateur Militaire. Paris: 1st November, 1902.—"Our Policy in Morocco" (*continued*). "The Campaign of 1813" (*continued*). "Plateau de Langres, Faucilles, and Haute-Saône" (*continued*). "History of the Gardes Françaises" (1 plate, *continued*). "Reciprocity Amongst Soldiers" (*concluded*). 15th November.—"Our Policy in Morocco" (*continued*). "The Campaign of 1813" (1 sketch, *continued*). "On the Initiative of Subordinate Commanders." "History of the Gardes Françaises" (*continued*).

Revue de Cavalerie. Paris: October, 1902.—"The Roland Scheme and the Cavalry." "Development of the Education and of the Character of the Officer." "Gassion, Cavalry Camp Quartermaster-General, at the Battle of Rocroi, 1643." "Reconnaissance for Troops of all Arms by Cavalry Patrols." "The Brussels-Ostend Ride."

November, 1902.—"Evolution of Modern Cavalry." "Reconnaissance of Troops of all Arms by Cavalry Patrols" (*continued*). "Should Napoleonic Tactics be Abandoned?" "Gassion, Cavalry Camp Quartermaster-General, at the Battle of Rocroi, 1643" (*concluded*). "Detailed Description of a Light *Matériel*, in use by Cavalry, for the Passage of Rivers."

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November, 1902.—"The *Rôle* and the Training of Artillery Scouts." "Organisation of a Practice Ground for Q.F. Artillery." "Cyclist Curiosities."

Revue du Service de l'Intendance Militaire. Paris: October, 1902.—"Study of the Action that Commissariat Officials may have to carry out in the name of the

State." "Purification of Drinking Water in the Field." "The various Boards through whom the Subsistence Service is carried out." "Principal Forage Plants" (*concluded*).

November, 1902.—Has not been received.

Revue Militaire. Paris: November, 1902.—"The Non-recoiling Gun Question in Germany." "Changes introduced in Artillery Organisation in Italy." "The Possibility of a Russian Campaign against India" (*concluded*). "Studies of the South African War, 1899-1900" (*continued*).

Revue d'Histoire. Paris: November, 1902.—"The Operations at Denain" (*concluded*). "The Campaign of 1805 in Germany—Ulm" (*continued*). "The Charges at Somosierra." "The War of 1870-71—The 9th August in Lorraine"

Journal des Sciences Militaires. Paris: November, 1902.—"The *Rôle* of Langres in Past and in Future Invasions" (*continued*). "The Campaign of 1815." "The Service of Two Years—The Recruitment of Reserve Officers" (*continued*). "The Present Instruction of Elementary Topography in the Army." "The War of Succession in Austria, 1740-1748" (*continued*). "Tonkin after the Conquest of 1884-85."

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GERMANY.—*Militär-Wochenblatt.* Berlin: 1st November, 1902.—"Problems in the Art of War." "The Imperial Manœuvres of 1902" (*continued*). "The Autumn Campaign of 1813" (*concluded*). "Military Matters in Switzerland." 5th November.—"Moltke's Military Correspondence, 1859." The Grand Manœuvres of the French Army in 1902." 8th November.—"Moltke's Military Correspondence, 1859" (*concluded*). "The Value of Drill and its Limitations." "The Imperial Manœuvres of 1902" (*continued*). "Intelligence from the French Army." 12th November.—"Moltke's Military Correspondence, 1859" (*concluded*). "Scouts for Field Howitzers." "The Grand Manœuvres of the French Army in 1902" (*concluded*). 15th November.—"The Employment and the Leading of the Cavalry in 1870, until the Capitulation at Sedan." "The Railway War in South Africa." "The New Promotion Regulations for the French Army." "Correction." 19th November.—"The Work of the General Staff in the Seven Years' War." "The Army and the Colonies." "Intelligence from the Belgian Army." 22nd November.—"Imperial Manœuvres of 1902" (*concluded*). "Hic Rhodus, Hic Salta." "Military Historical Works." "Improvement of Field Firing." "The Italian War Department." 24th November.—"Entrance Examinations for the École Supérieure in Paris, and those for the Obtaining of a Staff Certificate." 26th November.—"The Imperial Manœuvres of 1902" (*concluded*). "Germany in China." 29th November.—"From the History of the Duke of Saxony's 4th Rheinbund Regiment, 1807." "Range-finding on Service with the Field Artillery." "Operations of the South Germans from the 5th to the 7th July, 1866."

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of the French Naval Manœuvres." "German Ironclads." "The Military Position of Italy."

Jahrbücher für die Deutsche Armee und Marine. Berlin: November, 1902.—"The Scientific Grounding of Officers, and the Re-organisation of Cadet Corps. "The Massed Cavalry Attacks against other Arms in our Grand Manœuvres." "The Technique of Drill Formations in the Infantry." "Siege Operations in Theory and in Practice." "This Year's French Autumn Manœuvres." "The 8th Division in Action, near Swiepwald, on the 3rd July, 1866."

ITALY.—*Rivista di Artiglieria e Genio.* Rome: November, 1902.—Has not been received.

Rivista Militare Italiana Rome: November, 1902.—Has not been received.

PORTUGAL.—*Revista de Engenheria Militar.* Lisbon: October and November, 1902.—Have not been received.

Revista de Infanteria. Lisbon: November, 1902.—"History of the Portuguese Infantry." "Topographical Equipment." "Infantry Equipments." "The Autumn Manœuvres of the First Army Division." "On Gymnastics."

RUSSIA.—*Voïennyi Sbornik.* St. Petersburg: October, 1902.—"The Guard Lancer Regiment of H.M. The Empress Alexandra-Féodorovna at the Battle of Teliche, 16th-28th October, 1877." "Operations of the Corps Cavalry of the Advanced Guard in 1877" (*continued*). "The General Staff" (*continued*). "Sketch of the French Infantry" (*continued*). "Equitation, Modern Racing, and Training." "Field Artillery Tactics." "Fortress Manœuvres in the District of the Camp of Ons Ijora in August, 1902." "Military Doctors." "The Course of Oriental Languages for Officers, given at the Asiatic Department of the Ministry for Foreign Affairs." "The War of 1877-78" (*continued*). "The Preparation of Germany for War, from a Financial Point of View."

November, 1902.—"The Assault of Kars on the night of the 5th-6th November, 1877." "The Fall of Plevna on the 28th November, 1877." "Operations of the Corps Cavalry of the Advanced Guard in 1877" (*concluded*). "The General Staff" (*continued*). "Sketch of the French Infantry" (*continued*). "Shoeing and Cavalry Farrier Sergeants." "Artillery Regulations." "The Present Resources of Field Fortifications." "The Kieff Mutual Aid Society." "The War of 1877-78" (*continued*). "Paul Andrévitch Fedotoff." "Means for Avoiding the Harmful Consequences of Short Service in the Armies of Western Europe."

SPAIN.—*Memorial de Ingenieros del Ejercito.* Madrid: November, 1902.—Has not been received.

Revista Técnica de Infanteria y Caballeria. Madrid: 1st November, 1902.—"A Glorious Record of the Spanish Cavalry" (*continued*). "The Cavalry at Fœschwiller" (*continued*). "A Study on the Spanish Mauser, Model 1893" (*continued*).

15th November.—"Some Data Referring to the Empire of Morocco." "A Glorious Record of the Spanish Cavalry" (*concluded*). "A Study on the Spanish Mauser Model 1893" (*continued*). "Horses."

SWITZERLAND.—*Revue Militaire Suisse.*—Lausanne: November, 1902.—"Notes on the Artillery at the last Army Corps Manœuvres." "Exercises in Swimming Rivers by the Swiss Cavalry." "Imperial Austrian Manœuvres in Western Hungary." "The Krupp Gun, Model 1902; General von Reichenau's Field Gun." "Machine Guns in the German Army." "Field Firing by an Infantry Company."

UNITED STATES.—*The Journal of the Military Service Institution.* Governor's Island, New York: November, 1902.—"A Moral Preparation of the Soldier for Service and Battle." "The Use of Native Troops in our New Possessions." "Training the National Guard Officer for National Defence." "The Mexican Military Academy." "The Campaign of Eckmühl." "The Coast Joints Manœuvres, 1902." "Translations and Reprints." "Comment and Criticism."

Journal of the U.S. Cavalry Association.—Fort Leavenworth, Kansas: October, 1902."—"The Cavalry Post, Fort Riley, Kansas." "The Order of the Cincinnati." "Practical Points in Sanitation." "Training the Recruit." "Cavalry Bits." "Packs and Packing." "Range Horses for Cavalry." "Our Cow-boy Regulation Stirrup." "Company Target Reports." "Reprints."

NOTICES OF BOOKS.

A History of the Peninsular War. By CHARLES OMAN, M.A., Fellow of All Souls' College and Deputy Professor of Modern History, Oxford. Vol. I. 1807—1809. From the Treaty of Fontainebleau to the Battle of Corunna. With maps and plans. Oxford: Clarendon Press. 1902. Price 14s.

In his introduction, Mr. Oman apologises for his apparent presumption in undertaking to reconstruct the history of the greatest series of land campaigns which England has ever fought out to a victorious conclusion; but no apology was really needed, for, with Mr. Oman, all soldiers who study their profession had long been aware of the necessity for a fresh summing up of existing information, to correct and throw additional light upon the many points on which it was impossible for contemporary writers to possess the exact knowledge of circumstances which is only now becoming available through the gradual opening up of the archives of foreign nations.

It is, however, much to be regretted that before committing himself to his great undertaking he did not consult some of the many students of military history in the Army, who, being acquainted with the historical researches which are in course of execution in other Armies, might have called his attention to an enormous amount of valuable information which is in process of dissemination by the Historical Sections of all the Great military organisations on the Continent, and more particularly for his purposes by that of the French General Staff, which is reproducing the whole mass of material collected in the Archives of the Ministry of War.

It has long been recognised that, as an aid to critical study, Napier's great work was practically valueless; his extraordinary bias in favour of the Emperor and his

prejudice against the Spaniards, to both of which Mr. Oman calls attention in words of studious moderation, have exercised for years a "chauvinistic" influence on English military evolution almost as disastrous as that of Thiers and Jomini upon the French nation, and we welcome any information which will tend to show matters in their true proportion. It is somewhat of a pity that the author did not ascertain from some military expert those special points of importance on which in the interests of the fighting power of the nation information was particularly required. All the facts must have come under his notice in the course of his investigations, but, possibly, from want of personal knowledge of military subjects, those he has selected are often not of prime importance, and as a consequence much of his labour has been wasted.

Unfortunately this is a fault common to almost all civilian authors who devote themselves to Military History: although in every other department of human knowledge, if a man proposes to write a book, he generally goes to the experts in his particular branch of study to find out what has already been accomplished in the same field. In Military History, however, the one subject of all others in which from the extreme multiplicity of the factors involved and their wide individual range of variability such precaution is particularly required, it appears to be almost universally neglected, with results which are disastrous to the spread of military education in the country, for the soldiers who cannot find the information they require refuse to buy, and the publisher, losing his best market, concludes that there is no demand for military works, and refuses to try his fortune with other perhaps sounder issues, with the final result that at the present moment England hardly possesses a single military work of original thought and execution worthy of serious attention. But that such works would pay is evinced by the success of such works as those by Captain Mahan and Colonel Henderson's "Life of Stonewall Jackson."

"War," as Moltke has told us, "is the practical adaptation of the means at hand to the attainment of the object in view," as a consequence, to form an opinion on the relative merits of the conduct of a given campaign, an accurate knowledge of the "means at hand," *i.e.*, the Armies, their peculiarities of tactics and training, the internal forces at work within them, the nature of the country and the difficulties of supply, etc., forms an indispensable preliminary of all inquiry.

This point Mr. Oman recognises, and he gives us a summary of the conditions existing in the several Armies, and the theatre of operations which shows great industry but a certain want of expert knowledge. It is as if a man were to attempt a history of the construction of the Forth Bridge and show himself in his first pages to be ignorant of the essential differences between wrought iron and steel; his appreciation of the merits of the designer would attract little attention from professional bridge-builders, and this is likely to be the fate of Mr. Oman's work. We do not object to any one statement taken by itself in his book, but we object to the relative order of importance in which he ranges his facts, and the way he connects them together. Our imaginary bridge historian might, for instance, describe the properties of steel or wrought iron in a manner equally applicable to either, for it is hard to say where the one begins and the other ends; but if he ignored the part played by greater or less percentage of carbon in determining the strength of either, the defect would be fatal to his work in expert eyes.

There is not space here to analyse these chapters at length, but for those who want a striking example of the two kinds of work, we would recommend a comparison side by side of Lettow-Vorbeck's campaign, 1806–7, and the corresponding chapters of the present

work. As a single example for those who cannot read the above-mentioned work, we cite Mr. Oman's reference to the action of the British Cavalry and the Duke of Wellington's views on the subject, as it is strictly analogous to the criticisms which have again been levelled at that arm during the recent war. From both, we gather that the inefficiency complained of is looked upon as an inherent defect in the nature of the British soldier due to his rashness, headlong courage, and carelessness about his horse. We submit, however, that the ultimate cause lies primarily in the fact that in both cases our horses had to make long voyages over sea, as a consequence they landed out of condition, and being put to work at once the wastage was enormous; this wastage had to be made good by fresh supplies secured from hand to mouth, and as a consequence we never had time to break in and train the horses and fuse them into organised bodies capable of collective action in several units. The Duke said, one English squadron was as good as or better than any French one, but he did not care to see four of our squadrons against four of theirs, and with larger numbers the advantage was on the French side; but if the French had had to cross the sea and we had come over land, we venture the opinion that the larger our numbers the greater would have been our advantage. Experience alone teaches horse-mastership in our own and other Armies.

Beyond these special points we have no comments to make. The narrative is fascinating, and Mr. Oman handles his documentary evidence with conspicuous fairness and judgment, and we can only hope that it will not be long before the remainder of this fascinating history is in our hands.

PRINCIPAL ADDITIONS TO LIBRARY DURING NOVEMBER, 1902.

Hushed Up. By CHARLES WILLIAMS. Crown 8vo. 1s. London, 1902.

The Principles of Land Defence and their Application to the Conditions of To-day. By Captain H. F. THUILLIER, R.E. 8vo. London, 1902.

Recent British Battles on Land and Sea. By JAMES GRANT. 8vo. London, 1899.

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